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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE



In re application of:

DEANGELIS

Confirmation No. 9926

Serial No.: 08/797,188

Group Art Unit: 3712

Filing Date: February 11, 1997

Examiner: D. Muir

Title: **SYSTEM AND METHOD FOR CONTROLLING THE OPERATION OF TOYS**

**TRANSMITTAL LETTER**

MS Petitions

The Honorable Commissioner of Patents and Trademarks  
Alexandria, VA 22313

Sir:

Enclosed herewith for filing in the above-identified matter are the following documents:

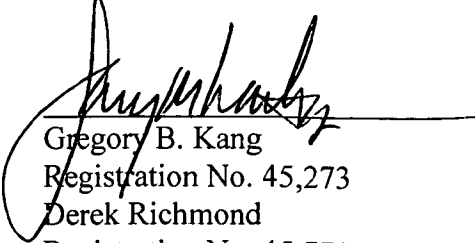
1. Transmittal Letter;
2. Petition to Revive Under 37 C.F.R. §1.137(b);
3. List of Correspondence between Applicant and Office in Response to U.S. PTO Request Under 37 C.F.R. §1.251;
4. Copy of File in Response to U.S. PTO Request Under 37 C.F.R. §1.251;
5. Statement that correspondence between Applicant and Office is complete under 37 C.F.R. §1.251;
6. Formal Drawings; and
7. Check No. 2724 in the amount of \$750.00 for Petition fees.

If an Extension of Time under 37 CFR § 1.136 is required and has not been separately requested herein, please consider this Transmittal Letter as including a request for such Extension of Time and as a further authorization to charge any fee for such Extension of Time, as may be required by 37 CFR § 1.17, to Deposit Account No. 14-0112. Also, please charge any fee deficiency, or credit any overpayment, in connection with this matter to Deposit Account No. 14-0112.

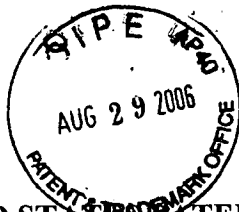
Respectfully submitted,  
**NATH & ASSOCIATES PLLC**

Date: August 29, 2006  
NATH & ASSOCIATES PLLC  
112 South West Street  
Alexandria, VA 22314  
(703)548-6248

By:

  
Gregory B. Kang  
Registration No. 45,273  
Derek Richmond  
Registration No. 45,771  
Customer No. 20259

Appl. No. 08/797,188  
Attorney Docket No. 90567U



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

DEANGELIS

Confirmation No. 9926

Serial No.: 08/797,188

Group Art Unit: 3712

Filing Date: February 11, 1997

Examiner: D. Muir

Title: **SYSTEM AND METHOD FOR CONTROLLING THE OPERATION OF TOYS**

The Honorable Commissioner of Patents and Trademarks  
P.O. Box 1450  
Alexandria, VA 22313-1450

**PETITION UNDER 37 CFR 1.137(b)**

This is a Petition to Revive the above-captioned application under 37 CFR 1.137(b) as an unintentional abandonment.

- 1) The present application was filed on February 3, 1997.
- 2) A notice of Allowance was mailed on May 23, 2000 and indicated that claims 1 – 13, 15 – 20, 22 – 30, 32 – 80, 82 – 113, 120 – 129, 142 – 149, 142 – 154 and 159 – 164 were allowed. The Notice of Allowance further indicated that the Applicant must file formal drawings in accordance with changes required by the Notice of Draftsperson's Patent Drawing Review (attached to paper no. 6).
- 3) On August 2, 2000, Applicant filed a Change of Correspondence Address; Issue fee payment; formal drawings; and a self-addressed post card with a request that the postcard be returned with a Patent Office date stamp.
- 4) Applicant received its self addressed post card with a date stamp of August 7, 2000, a copy of which is attached as in the Appendix to this paper.

08/31/2006 MAHMED1 00000051 08797188



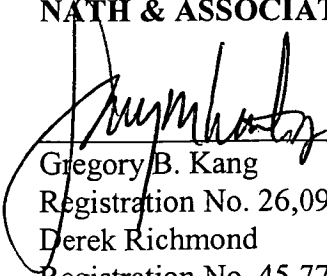
- 5) Since receiving the self addressed post card, Applicant received no further communication from the U.S. PTO through May of 2006.
- 6) On June 8, 2006, Applicant received a Notice of Abandonment, which cited failure to respond to a U.S. PTO Request For a Copy of Applicant's File Under 37 C.F.R. §1.251.
- 7) Applicant never received the Request For a Copy of Applicant's File Under 37 C.F.R. §1.251; the Notice of Abandonment does not indicate when the Request For a Copy of Applicant's File Under 37 C.F.R. §1.251 was mailed.
- 8) Applicant contacted the Petitions Office of the U.S. PTO and determined that the U.S. PTO still needs formal drawings to be submitted.

Applicant submits that the entire delay in filing a Response to the U.S. PTO Request For a Copy of Applicant's File Under 37 C.F.R. §1.251 until the filing of this petition was unintentional and that no terminal disclaimer is required in this case.

By this Petition, Applicant respectfully submits the required copy of Applicant's file. Applicant also submits formal drawings in response to the Notice of Draftsperson's Patent Drawing Review.

Please charge any fee deficiency, or credit any overpayment, in connection with this matter to Deposit Account No. 14-0112.

Date: August 29, 2006  
NATH & ASSOCIATES PLLC  
112 South West Street  
Alexandria, VA 22314  
(703) 548-6284

Respectfully submitted,  
**NATH & ASSOCIATES PLLC**  
  
By: \_\_\_\_\_  
Gregory B. Kang  
Registration No. 26,095  
Derek Richmond  
Registration No. 45,771  
Customer No. 20259

Appl. No. 08/797,188  
Attorney Docket No. 90567U



**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re application of:

DEANGELIS

Confirmation No. 9926

Serial No.: 08/797,188

Group Art Unit: 3712

Filing Date: February 11, 1997

Examiner: D. Muir

Title: **SYSTEM AND METHOD FOR CONTROLLING THE OPERATION OF TOYS**

The Honorable Commissioner of Patents and Trademarks  
P.O. Box 1450  
Alexandria, VA 22313-1450

**STATEMENT THAT CORRESPONDENCE BETWEEN APPLICANT AND OFFICE IS  
COMPLETE UNDER 37 C.F.R. 1.251**

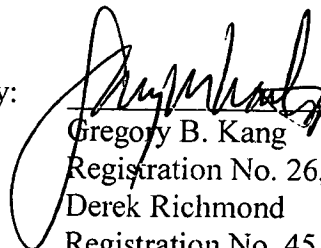
The attached copy of Applicant's file is a complete and accurate copy of the applicant's record of all of the correspondence between the Office and the Applicant for the present application (except for U.S. patent documents). Applicant is not aware of correspondence between the Office and the applicant for the present application that is not among Applicant's records. Applicant further submits that the entire delay in filing a copy of the reconstructed file was unintentional and that no terminal disclaimer is required in this case.

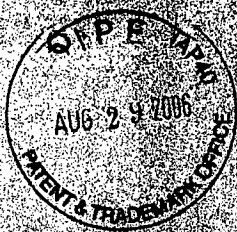
Respectfully submitted,

**NATH & ASSOCIATES PLLC**

Date: August 29, 2006  
NATH & ASSOCIATES PLLC  
112 South West Street  
Alexandria, VA 22314  
(703) 548-6284

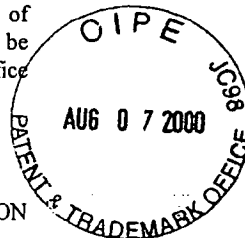
By:

  
\_\_\_\_\_  
Gregory B. Kang  
Registration No. 26,095  
Derek Richmond  
Registration No. 45,771  
Customer No. 20259



BEST AVAILABLE COPY

Please acknowledge receipt of our Transmittal Form (PTO/SB21); **ISSUE FEE TRANSMITTAL FORM PTOL-85B** (w/Certificate of Mailing thereon, in duplicate); Notice of Allowability (copy); Transmittal of Formal Drawings (10 pgs., Figs. 1-10); Fee Transmittal (PTO/SB17); Change of Correspondence Address; and our check No. 067745 in the amount of **\$605.00** to cover the payment of the Issue Fee (Advance Copies to be charged against Acct. No. 06-2425), by affixing hereon the Patent Office date stamp and returning this card to our office.



In re application of: PETER C. DeANGELIS  
Serial No. 08/797,188  
Title: SYSTEM AND METHOD FOR CONTROLLING THE OPERATION OF TOYS

Filed: February 11, 1997

Due: August 23, 2000

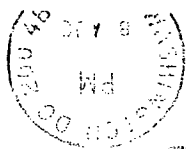
Mailed: August 2, 2000

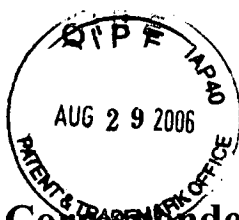
Docket No. ROKEN-40907

ERR:dmc

**BOX ISSUE FEE**

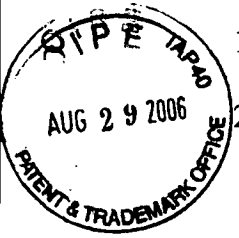
102080.5





## List of Correspondence between Applicant and Office;

## 90567U-1 - Documents From Patent Office



- 1) June 8, 2006
  - a) Notice of Abandonment
- 2) May 23, 2000
  - a) Notice of Allowability
  - b) Notice of Allowance and Issue Fee Due
  - c) Examiner's Amendment
- 3) December 29, 1999
  - a) Office Action Summary
  - b) Detailed Action
  - c) Notice of References Cited
- 4) August 10, 1999
  - a) Advisory Action
- 5) April 29, 1999
  - a) Office Action Coversheet
  - b) Office Action Summary
  - c) Detailed Action
- 6) July 8, 1998
  - a) Office Action Coversheet
  - b) Office Action Summary
  - c) Detailed Action
  - d) Notice of Draftsperson's Patent Drawing Review – PTO Form 948
- 7) June 4, 1997
  - a) United States Patent and Trademark Office Notice of Recordation of Assignment Document
  - b) PTO Form 1595 – Assignment Recordation Sheet
  - c) Assignment
- 8) May 5, 1997
  - a) Official Filing Receipt

## 90567U-2 - Documents Filed in Patent Office

- 1) August 7, 2000
  - a) Stamped Filing Receipt
  - b) Check No. 067745
  - c) Transmittal Form
  - d) Part B – Issue Fee Transmittal
  - e) Transmittal of Formal Drawings
  - f) Fee Transmittal
  - g) Figures 1, 2, 3, 4, 5, 6A, 6B, 7, 8, 9-1, 9-2, 10, 11
  - h) Change of Correspondence Address
- 2) March 7, 2000
  - a) Stamped Filing Receipt
  - b) Transmittal Form
  - c) Amendment
- 3) August 19, 1999
  - a) Stamped Filing Receipt
  - b) Transmittal Form
  - c) Third Supplemental Amendment Under Rule 116
- 4) August 13, 1999
  - a) Continued Prosecution Application
    - i) Filing Receipt
    - ii) Express Mail Label
    - iii) CPA Transmittal
    - iv) Claims Worksheet
    - v) Fee Transmittal
    - vi) Preliminary Amendment
    - vii) Check # 062763
- 5) July 29, 1999
  - a) Stamped Filing Receipt
  - b) Transmittal Form
  - c) Patent Application Fee Determination Record
  - d) Second Supplemental Amendment Under Rule 116
- 6) July 19, 1998
  - a) Stamped Filing Receipt
  - b) Transmittal Form
  - c) Patent Application Fee Determination Record
  - d) Supplemental Amendment Under Rule 116
- 7) July 12, 1999
  - a) Stamped Filing Receipt
  - b) Transmittal Form
  - c) Fee Transmittal
  - d) Patent Application Fee Determination Record
  - e) Amendment Under Rule 116
  - f) Check # 062233
  - g) Amendment Under Rule 116

## 90567U-1 - Documents Filed in Patent Office

- 1) January 19, 1999
  - a) Stamped Filing Receipt
  - b) Transmittal Form
  - c) Supplemental Amendment
- 2) December 9, 1998
  - a) Stamped Filing Receipt
  - b) Transmittal Form
  - c) Fee Transmittal
  - d) Terminal Disclaimer
  - e) Check # 059157
- 3) December 9, 1998
  - a) Stamped Filing Receipt
  - b) Transmittal Form
  - c) Fee Transmittal
  - d) Terminal Disclaimer
  - e) Check # 059156
- 4) December 9, 1998
  - a) Stamped Filing Receipt
  - b) Transmittal Form
  - c) Fee Transmittal
  - d) Patent Application Fee Determination Record
  - e) Amendment
  - f) Check # 059155
- 5) May 11, 1998
  - a) Stamped Filing Receipt
  - b) Information Disclosure Statement
  - c) PTO Form 1449
- 6) April 20, 1998
  - a) Stamped Filing Receipt
  - b) Transmittal Form
  - c) Preliminary Amendment
- 7) October 31, 1997
  - a) Stamped Filing Receipt
  - b) Preliminary Amendment
  - c) Disclosure Statement
- 8) May 19, 1997
  - a) Stamped Filing Receipt
  - b) Disclosure Statement
- 9) February 11, 1997
  - a) Patent Application
    - i) Stamped Filing Receipt
    - ii) Express Mail Labor
    - iii) Check # 048981
    - iv) Transmittal
    - v) Assignment Recordation Form
    - vi) Assignment

**90567U-1 - Documents Filed in Patent Office**

- vii) Specification
- viii) Declaration
- ix) Figures 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11
- x) Claims
- xi) Abstract
- xii) Declaration of Small Entity Status





# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
08/797,188	02/11/1997	PETER C. DEANGELIS	KOSTS-40907 <b>ROKEN</b>	9926
24201 7590 06/08/2006 FULWIDER PATTON 6060 CENTER DRIVE 10TH FLOOR LOS ANGELES, CA 90045			EXAMINER MUIR, DAVID N	
JUN 12 2006			ART UNIT 3712 PAPER NUMBER	
DATE MAILED: 06/08/2006				

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Notice of Abandonment</b>	Application No.	Applicant(s)	
	08/797,188	DEANGELIS, PETER C.	
	Examiner	Art Unit	
	Muir, David N***	3712	

— The MAILING DATE of this communication appears on the cover sheet with the correspondence address—

This application is abandoned in view of:

1. ☐ Applicant's failure to timely file a proper reply to the Office letter mailed on \_\_\_\_\_.
  - (a) ☐ A reply was received on \_\_\_\_\_ (with a Certificate of Mailing or Transmission dated \_\_\_\_\_), which is after the expiration of the period for reply (including a total extension of time of \_\_\_\_\_ month(s)) which expired on \_\_\_\_\_.
  - (b) ☐ A proposed reply was received on \_\_\_\_\_, but it does not constitute a proper reply under 37 CFR 1.113 (a) to the final rejection. (A proper reply under 37 CFR 1.113 to a final rejection consists only of: (1) a timely filed amendment which places the application in condition for allowance; (2) a timely filed Notice of Appeal (with appeal fee); or (3) a timely filed Request for Continued Examination (RCE) in compliance with 37 CFR 1.114).
  - (c) ☐ A reply was received on \_\_\_\_\_ but it does not constitute a proper reply, or a bona fide attempt at a proper reply, to the non-final rejection. See 37 CFR 1.85(a) and 1.111. (See explanation in box 7 below).
  - (d) ☐ No reply has been received.
2. ☐ Applicant's failure to timely pay the required issue fee and publication fee, if applicable, within the statutory period of three months from the mailing date of the Notice of Allowance (PTOL-85).
  - (a) ☐ The issue fee and publication fee, if applicable, was received on \_\_\_\_\_ (with a Certificate of Mailing or Transmission dated \_\_\_\_\_), which is after the expiration of the statutory period for payment of the issue fee (and publication fee) set in the Notice of Allowance (PTOL-85).
  - (b) ☐ The submitted fee of \$\_\_\_\_\_ is insufficient. A balance of \$\_\_\_\_\_ is due.  
The issue fee required by 37 CFR 1.18 is \$\_\_\_\_\_. The publication fee, if required by 37 CFR 1.18(d), is \$\_\_\_\_\_.
  - (c) ☐ The issue fee and publication fee, if applicable, has not been received.
3. ☐ Applicant's failure to timely file corrected drawings as required by, and within the three-month period set in, the Notice of Allowability (PTO-37).
  - (a) ☐ Proposed corrected drawings were received on \_\_\_\_\_ (with a Certificate of Mailing or Transmission dated \_\_\_\_\_), which is after the expiration of the period for reply.
  - (b) ☐ No corrected drawings have been received.
4. ☐ The letter of express abandonment which is signed by the attorney or agent of record, the assignee of the entire interest, or all of the applicants.
5. ☐ The letter of express abandonment which is signed by an attorney or agent (acting in a representative capacity under 37 CFR 1.34(a)) upon the filing of a continuing application.
6. ☐ The decision by the Board of Patent Appeals and Interference rendered on \_\_\_\_\_ and because the period for seeking court review of the decision has expired and there are no allowed claims.
7. ☒ The reason(s) below:

Applicant's failure to timely respond within the three-month period set to the Request for Reconstruction Notice under 37 CFR 1.251.

*Unprocessable*

*equivalent of Abandoned Application, re-exam proceeding a lapsed patent*

Petitions to revive under 37 CFR 1.137(a) or (b), or requests to withdraw the holding of abandonment under 37 CFR 1.181, should be promptly filed to minimize any negative effects on patent term.

U.S. Patent and Trademark Office  
PTOL-1432 (Rev. 04-01)

Notice of Abandonment

Part of Paper No. 20060608

*Patent to be granted*



UNITED STATES DEPARTMENT OF COMMERCE  
Patent and Trademark Office  
Address: COMMISSIONER OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231

797 188  
APPLICATION NUMBER FILING DATE FIRST NAMED APPLICANT ATTORNEY DOCKET NO.

EXAMINER

ART UNIT PAPER NUMBER

DATE MAILED:

This is a communication from the examiner in charge of your application.  
COMMISSIONER OF PATENTS AND TRADEMARKS

NOTICE OF ALLOWABILITY

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance and Issue Fee Due or other appropriate communication will be mailed in due course.

- ☒ This communication is responsive to Amendment I Filed 3/7/00
- ☒ The allowed claim(s) is/are 1-13, 15-20, 22-30, 32-80, 82-93, 122-128, 146-149, 152-154 & 159-164
- ☒ The drawings filed on 8/13/99 are acceptable. revised on 1-12-00
- ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- ☐ All ☐ Some\* ☐ None of the CERTIFIED copies of the priority documents have been
- ☐ received.
- ☐ received in Application No. (Series Code/Serial Number) \_\_\_\_\_
- ☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\*Certified copies not received: \_\_\_\_\_

- ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

A SHORTENED STATUTORY PERIOD FOR REPLY to comply with the requirements noted below is set to EXPIRE THREE MONTHS FROM THE "DATE MAILED" of this Office action. Failure to timely comply will result in ABANDONMENT of this application. Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

- ☐ Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL APPLICATION, PTO-152, which discloses that the oath or declaration is deficient. A SUBSTITUTE OATH OR DECLARATION IS REQUIRED.
- ☒ Applicant MUST submit NEW FORMAL DRAWINGS
- ☐ because the originally filed drawings were declared by applicant to be informal.
- ☒ including changes required by the Notice of Draftperson's Patent Drawing Review, PTO-948, attached hereto or to Paper No. 6
- ☐ including changes required by the proposed drawing correction filed on \_\_\_\_\_, which has been approved by the examiner.
- ☐ including changes required by the attached Examiner's Amendment/Comment.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the reverse side of the drawings. The drawings should be filed as a separate paper with a transmittal letter addressed to the Official Draftperson.

- ☐ Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Any reply to this notice should include, in the upper right hand corner, the APPLICATION NUMBER (SERIES CODE/SERIAL NUMBER). If applicant has received a Notice of Allowance and Issue Fee Due, the ISSUE BATCH NUMBER and DATE of the NOTICE OF ALLOWANCE should also be included.

Attachment(s)

- ☐ Notice of References Cited, PTO-892
- ☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). \_\_\_\_\_
- ☐ Notice of Draftperson's Patent Drawing Review, PTO-948
- ☐ Notice of Informal Patent Application, PTO-152
- ☐ Interview Summary, PTO-413
- ☒ Examiner's Amendment/Comment
- ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
- ☐ Examiner's Statement of Reasons for Allowance



UNITED STATES DEPARTMENT OF COMMERCE  
Patent and Trademark Office

06/02/00  
W.C.

NOTICE OF ALLOWANCE AND ISSUE FEE DUE

*Err*  
FULWIDER PATTON LEE & UTECHT  
10877 WILSHIRE BOULEVARD  
TENTH FLOOR  
LOS ANGELES CA 90024

QM12/0523

RECEIVED

BY DOCKET DEPT.

MAY 31 2000

FULWIDER PATTON LEE & UTECHT  
LOS ANGELES

APPLICATION NO.	FILING DATE	TOTAL CLAIMS	EXAMINER AND GROUP ART UNIT	DATE MAILED
08/797,188	02/11/97	126	MUIR, D	3712 05/23/00
First-Named Applicant	DEANGELIS,	35 USC 154(b) term ext. = 0 Days.		

TITLE OF INVENTION SYSTEM AND METHOD FOR CONTROLLING THE OPERATION OF TOYS

*Issue Fee / Drawings / Reminder to File Continuation: August 23, 2000*

ATTY'S DOCKET NO.	CLASS-SUBCLASS	BATCH NO.	APPLN. TYPE	SMALL ENTITY	FEE DUE	DATE DUE
3 <i>ROSEN</i>	0801S-40907	446-456.000	M9U UTILITY	YES	\$605.00	08/23/00

**THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED.**

**THE ISSUE FEE MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED.**

**HOW TO RESPOND TO THIS NOTICE:**

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

- A. If the status is changed, pay twice the amount of the FEE DUE shown above and notify the Patent and Trademark Office of the change in status, or
- B. If the status is the same, pay the FEE DUE shown above.

If the SMALL ENTITY is shown as NO:

- A. Pay FEE DUE shown above, or
- B. File verified statement of Small Entity Status before, or with, payment of 1/2 the FEE DUE shown above.

II. Part B-Issue Fee Transmittal should be completed and returned to the Patent and Trademark Office (PTO) with your ISSUE FEE. Even if the ISSUE FEE has already been paid by charge to deposit account, Part B Issue Fee Transmittal should be completed and returned. If you are charging the ISSUE FEE to your deposit account, section "4b" of Part B-Issue Fee Transmittal should be completed and an extra copy of the form should be submitted.

III. All communications regarding this application must give application number and batch number. Please direct all communications prior to issuance to Box ISSUE FEE unless advised to the contrary.

**IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.**


YOUR COPY

Art Unit: 3712

### EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.
2. The application has been amended as follows:  
  
Claim 158, dependent upon claim 157 which has been canceled, has itself been canceled.
3. Any inquiry concerning this communication should be directed to D. Neal Muir at telephone number (703) 308-1206.

DNM  
May 22, 2000

  
D. Neal Muir  
Primary Examiner  
Art Unit 3712



*Callendar*  
**UNITED STATES DEPARTMENT OF COMMERCE  
Patent and Trademark Office**

Address: COMMISSIONER OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
08/797,188	02/11/97	DEANGELIS	

*ENR*  
FULWIDER PATTON LEE & UTECHT  
10877 WILSHIRE BOULEVARD  
TENTH FLOOR  
LOS ANGELES CA 90024

DM12/1229

EXAMINER	
MUIR, D	
ART UNIT	PAPER NUMBER
3712	17

DATE MAILED:

12/29/99

*Response due: March 29, 2000*  
Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

**RECEIVED**  
BY DOCKET DEPT.

JAN - 5 2000

FULWIDER PATTON LEE & UTECHT  
LOS ANGELES

# Office Action Summary

Application No.  
08/797,188

Applicant(s)

DeAngelis

Examiner

Neal Muir

Group Art Unit  
3712



☒ Responsive to communication(s) filed on Aug 19, 1999

☐ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

## Disposition of Claims

☒ Claim(s) 1-13, 18-30, 32-113, 122-128, 146-149, and 152-164 is/are pending in the application.

Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

☐ Claim(s) \_\_\_\_\_ is/are allowed.

☒ Claim(s) 1-13, 18-30, 32-113, 122-128, 146-149, and 152-164 is/are rejected.

☐ Claim(s) \_\_\_\_\_ is/are objected to.

☐ Claims \_\_\_\_\_ are subject to restriction or election requirement.

## Application Papers

☒ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on \_\_\_\_\_ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some\* ☐ None of the CERTIFIED copies of the priority documents have been

☐ received.

☐ received in Application No. (Series Code/Serial Number) \_\_\_\_\_

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\*Certified copies not received: \_\_\_\_\_

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

## Attachment(s)

☒ Notice of References Cited, PTO-892

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). \_\_\_\_\_

☐ Interview Summary, PTO-413

☒ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

— SEE OFFICE ACTION ON THE FOLLOWING PAGES —

Art Unit: 3712

*Amendment*

1. Amendment "H" has been received and made of record as Paper Number 16.

This paper specifies that certain claims are to be retained, "please retain only the following claims...." but fails to provide precise instructions regarding the remaining claims. Claims remaining under consideration are 1-13, 18-30, 32-113, 122-128, 146-149 and 152-164.

*Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371© of this title before the invention thereof by the applicant for patent.

(g) before the applicant's invention thereof the invention was made in this country by another who had not abandoned, suppressed, or concealed it. In determining priority of invention there shall be considered not only the respective dates of conception and reduction to practice of the invention, but also the reasonable diligence of one who was first to conceive and last to reduce to practice, from a time prior to conception by the other.

3. Claims 1-13, 18-30, 32-113, 122-128, 146-149 and 152-164 are rejected under 35 U.S.C. 102(a) and <sup>c, d, e</sup> f and g) as being clearly anticipated by Crane et al. '609. See especially claims 3+ for the central station, claims 14+ for the interrogation of pads and claims 67+ for lights on vehicles and pads.



Art Unit: 3712


*Prior Art*

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Barton Jr., et al discloses a central station and a plurality of pads for vehicle orders.

5. Any inquiry concerning this communication should be directed to D. Neal Muir at telephone number (703) 308-1206.

DNM  
December 15, 1999

  
D. Neal Muir  
Examiner  
Art Unit 3712

**Notice of References Cited**Application No.  
**08/797,188**

Applicant(s)

**DeAngelis**

Examiner

**Neal Muir**

Group Art Unit

**3712**

Page 1 of 1

**U.S. PATENT DOCUMENTS**

	DOCUMENT NO.	DATE	NAME	CLASS	SUBCLASS
A	5,944,609	8-1999	Crane et al.	463	62
B	5,888,135	3-1999	Barton, Jr., et al.	463	39
C					
D					
E					
F					
G					
H					
I					
J					
K					
L					
M					

**FOREIGN PATENT DOCUMENTS**

	DOCUMENT NO.	DATE	COUNTRY	NAME	CLASS	SUBCLASS
N						
O						
P						
Q						
R						
S						
T						

**NON-PATENT DOCUMENTS**

	DOCUMENT (Including Author, Title, Source, and Pertinent Pages)	DATE
U		
V		
W		
X		



UNITED STATES DEPARTMENT OF COMMERCE  
Patent and Trademark Office  
Address: COMMISSIONER OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231

SERIAL NUMBER	FILING DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NO.
09/797,188	02/11/97	DEANGELIS	P

*ENR*  
FULWIDER PATTON LEE & UTECHT  
10877 WILSHIRE BOULEVARD  
TENTH FLOOR  
LOS ANGELES CA 90024

QM12/0810

EXAMINER	
MUIR, D	
ART UNIT	PAPER NUMBER
3712	13

DATE MAILED: 08/10/99

*Next appeal date: August 29, 1999*

Below is a communication from the EXAMINER in charge of this application

COMMISSIONER OF PATENTS AND TRADEMARKS

RECEIVED  
BY DOCKET DEPT

AUG 12 1999

FULWIDER PATTON LEE & UTECHT  
LOS ANGELES

ADVISORY ACTION

☒ THE PERIOD FOR RESPONSE:

- a) ☒ is extended to run 4 months or continues to run \_\_\_\_\_ from the date of the final rejection
- b) ☐ expires three months from the date of the final rejection or as of the mailing date of this Advisory Action, whichever is later. In no event however, will the statutory period for the response expire later than six months from the date of the final rejection.

Any extension of time must be obtained by filing a petition under 37 CFR 1.136(a), the proposed response and the appropriate fee. The date on which the response, the petition, and the fee have been filed is the date of the response and also the date for the purposes of determining the period of extension and the corresponding amount of the fee. Any extension fee pursuant to 37 CFR 1.17 will be calculated from the date of the originally set shortened statutory period for response or as set forth in b) above.

☒ Appellant's Brief is due in accordance with 37 CFR 1.192(a).

☒ Applicant's response to the final rejection, filed 7/21/99 has been considered with the following effect, but it is not deemed to place the application in condition for allowance:

1. ☒ The proposed amendments to the claim and/or specification will not be entered and the final rejection stands because:
- ☐ There is no convincing showing under 37 CFR 1.116(b) why the proposed amendment is necessary and was not earlier presented.
  - ☒ They raise new issues that would require further consideration and/or search. (See Note).
  - ☐ They raise the issue of new matter. (See Note).
  - ☒ They are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal.
  - ☐ They present additional claims without cancelling a corresponding number of finally rejected claims.

NOTE: Q43, you require a vehicle operative in a powered and inactive state, and 4m means to convert, Q44 means to convert to inactive after a time period, etc, requiring further search

2. ☐ Newly proposed or amended claims \_\_\_\_\_ would be allowed if submitted in a separately filed amendment cancelling the non-allowable claims.
3. ☒ Upon the filing an appeal, the proposed amendment ☐ will be entered ☒ will not be entered and the status of the claims will be as follows:

Claims allowed: 1-13, 15-22, 30, 32-35, 40-42, 57-60, 63-80, 82-91, 96-99, 104-106, 124, 125  
Claims objected to: 101, 102, 128  
Claims rejected: all remaining

However;

☐ Applicant's response has overcome the following rejection(s): \_\_\_\_\_

4. ☐ The affidavit, exhibit or request for reconsideration has been considered but does not overcome the rejection because \_\_\_\_\_

5. ☐ The affidavit or exhibit will not be considered because applicant has not shown good and sufficient reasons why it was not earlier presented.

☐ The proposed drawing correction ☐ has ☐ has not been approved by the examiner.

☐ Other

*D. Neal Muir*  
EXAMINER  
ART UNIT 3712



*Calendare*  
**UNITED STATES DEPARTMENT OF COMMERCE  
Patent and Trademark Office**

Address: COMMISSIONER OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
08/797,188	02/11/97	DEANGELIS	1005-40907

DN21/0429  
FULWIDER PATTON LEE & UTECHT  
10877 WILSHIRE BOULEVARD  
TENTH FLOOR  
LOS ANGELES CA 90024

EXAMINER
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MURKIN

ART UNIT	PAPER NUMBER
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3712

DATE MAILED: 04/29/99

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

*Final Action Response due: July 29, 1999*

**RECEIVED**  
BY DOCKET DEPT.

**MAY 03 1999**

FULWIDER PATTON LEE & UTECHT  
LOS ANGELES

# Office Action Summary

Application No.

08/797,188

Applicant(s)

DeAngelis

Examiner

Neal Muir

Group Art Unit

3712

☒ Responsive to communication(s) filed on Dec 9, 1998

☒ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

## Disposition of Claims

☒ Claim(s) 1-13, 18-30, 82-113, 122-128, 146-149, 152-164, and 3280 is/are pending in the application.

Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

☐ Claim(s) 1-17, 18-20, 30, 32-35, 40-42, 57-60, 101-90, 82-91, 91-99, 104-106, 124+125, 141, 149, 152, 153 & 162-164 is/are allowed.

☐ Claim(s) all remaining is/are rejected.

☒ Claim(s) 101, 102, and 128 is/are objected to.

☐ Claims \_\_\_\_\_ are subject to restriction or election requirement.

## Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on \_\_\_\_\_ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some\* ☐ None of the CERTIFIED copies of the priority documents have been

☐ received.

☐ received in Application No. (Series Code/Serial Number) \_\_\_\_\_

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\*Certified copies not received: \_\_\_\_\_

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

## Attachment(s)

☐ Notice of References Cited, PTO-892

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). \_\_\_\_\_

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

Art Unit: 3712

## DETAILED ACTION

### *Amendment*

1. Amendment "C" has been received and made of record as Paper Number 7.

### *Claim Rejections - 35 USC § 102*

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
3. Claims 61, 62, 146 and 147 are rejected under 35 U.S.C. 102(b) as being anticipated by Rosenhagen et al.

Rosenhagen discloses a toy which may be used in a central station environment with previously stored commands taking precedence over garbage that is input. Any controller may control any vehicle.

### *Claim Rejections - 35 USC § 103*

4. Claims 23-27, 107, 155, 157 and 159-161 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rosenhagen et al in view of Stern et al.

Art Unit: 3712

Rosenhagen lacks a central station, such as is taught by Stern. It would have been obvious to one of ordinary skill in the art to have provided a Rosenhagen set with a central station, as taught by stern, in order to only require one transmitter, thereby saving on electronic costs.

5. Claims 28, 29, 36-39, 43-56, 92-95, 100, 103, 108-110, 122, 123, 126, 127 and 154 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yavetz in view of Stern et al.

Yavetz discloses toys which may be selectively accessed but lacks a central station. The Yavetz controller features a plurality of lights, LED's 50,52,54 and 56, each linked to selection switches 42,44,46 and 48. He lacks a central station, such as is taught by Stern. It would have been obvious for one to have provided a Yavetz toy set with a central station, as taught by Stern, in order to provide a single transmitter, thereby saving on electronics costs. The substitution of a single sequential switch for object choosing in lieu of a plurality of individual switches is seen to have been an obvious choice of design well within the skill of one of ordinary skill in the art and would have been desired in that one sequential switch is much less expensive than several switches, both in terms of costs and assembly costs.

6. Claims 156 and 158 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rosenhagen et al in view of Stern et al as applied to claims 155 and 157 above, and further in view of Yavetz.

Rosenhagen, as modified, lacks indicator lights to indicate which vehicle is being accessed, something taught by Yavetz. It would have been obvious to have provided a Rosenhagen set with indicator lights, as taught by Yavetz, in order to ensure exactly which vehicle was being ordered.

Art Unit: 3712

7. Claims 111-113 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yavetz in view of Stern et al and Rosenhagen et al.

Yavetz lacks a central station, as taught by Stern, and the ability to access any vehicle, as taught by Rosenhagen. It would have been obvious to have provided a Yavetz set with a central station and the ability to control any vehicle, as taught by Stern and Rosenhagen, in order to save on electronic costs and to have the ability to capture an opponents' vehicle.

*Allowable Subject Matter*

8. Claims 1-13, 18-22, 30, 32-35, 40-42, 57-60, 63-80, 82-91, 96-99, ~~101, 102~~<sup>101, 102</sup>, 104-106, 124, 125, 148, 149, 152, 153 and 162-164 are allowed.

9. Claim <sup>101, 102</sup> 128 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

*Remarks*

10. Applicant's arguments with respect to claims 1-151 have been considered but are deemed to be moot in view of the new grounds of rejection.

Yavetz still discloses a toy set with a single controller accessing several toys with indicator lights to establish which toy vehicle is being used.



Art Unit: 3712

Stern et al does disclose a single track with several vehicles running thereon with a central station which each of the controllers is plugged into. It is understood that the station receives inputs from the controller as long as they are plugged in and stops when they are removed. It is considered that receipt of the inputs constitutes "inquiry" in the absence of limitations to the contrary.

Rosenhagen discloses the a toy set where any toy vehicle may be commanded by any controller where the toy has the requirement for continuing the last command until a valid subsequent command is issued. Any number of improper commands may be issued with no effect upon the toy chosen.

### *Conclusion*


11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Art Unit: 3712

12. Any inquiry concerning this communication should be directed to D. Neal Muir at telephone number (703) 308-1206.

DNM  
April 26, 1999



D. Neal Muir  
Examiner  
Art Unit 3712



*Calendar*  
UNITED STATES DEPARTMENT OF COMMERCE  
Patent and Trademark Office

Address: COMMISSIONER OF PATENTS AND TRADEMARKS  
Washington, DC 20231

APPLICATION NO.	FILING DATE	DEANSELIS	FIRST NAMED INVENTOR	F	ATTORNEY DOCKET NO.
087797188	02/11/97				<i>Roken - 40907</i>

*ENR*

DM11/0708

FULWIDER PATTON LEE & UTECHT  
10877 WILSHIRE BOULEVARD  
TENTH FLOOR  
LOS ANGELES CA 90024

MUIR, D EXAMINER

ART UNIT

PAPER NUMBER

*6*  
07/08/98

DATE MAILED:

*Response due: October 8, 1998*

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

**RECEIVED**  
BY DOCKET DEPT.

**JUL 13 1998**

FULWIDER PATTON LEE & UTECHT  
LOS ANGELES

## Office Action Summary

Application No.  
**08/797,188**

Applicant(s)  
**DeAngelis**

Examiner  
**Neal Muir**

Group Art Unit  
**3712**



☐ Responsive to communication(s) filed on \_\_\_\_\_.

☐ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

### Disposition of Claims

☒ Claim(s) 1-151 is/are pending in the application.

Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

☐ Claim(s) \_\_\_\_\_ is/are allowed.

☒ Claim(s) 1-151 is/are rejected.

☐ Claim(s) \_\_\_\_\_ is/are objected to.

☐ Claims \_\_\_\_\_ are subject to restriction or election requirement.

### Application Papers

☒ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on \_\_\_\_\_ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some\* ☐ None of the CERTIFIED copies of the priority documents have been  
☐ received.

☐ received in Application No. (Series Code/Serial Number) \_\_\_\_\_.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\*Certified copies not received: \_\_\_\_\_.

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

### Attachment(s)

☒ Notice of References Cited, PTO-892

☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). 2

☐ Interview Summary, PTO-413

☒ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

Art Unit:

## DETAILED ACTION

### *Drawings*

This application has been filed with informal drawings which are acceptable for examination purposes only. Formal drawings will be required if the application is allowed.

Note the enclosed PTO 948 for other deficiencies.

### *Double Patenting*

1. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321© may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

2. Claims 1-151 are provisionally rejected under the judicially created doctrine of double patenting over claims 1-97 of copending Application No. 08/578,210. This is a provisional double patenting rejection since the conflicting claims have not yet been patented.

Art Unit:

The subject matter claimed in the instant application is fully disclosed in the referenced copending application and would be covered by any patent granted on that copending application since the referenced copending application and the instant application are claiming common subject matter, as follows: a plurality of toy vehicles with control from any of a plurality of controllers with a central station to issue commands.

Furthermore, there is no apparent reason why applicant would be prevented from presenting claims corresponding to those of the instant application in the other copending application. See *In re Schneller*, 397 F.2d 350, 158 USPQ 210 (CCPA 1968). See also MPEP § 804.

3. Claims 1-151 are provisionally rejected under the judicially created doctrine of double patenting over claims 1-75 of copending Application No. 08/696,263. This is a provisional double patenting rejection since the conflicting claims have not yet been patented.

The subject matter claimed in the instant application is fully disclosed in the referenced copending application and would be covered by any patent granted on that copending application since the referenced copending application and the instant application are claiming common subject matter, as follows: a plurality of toy vehicles with control from any of a plurality of controllers with a central station to issue commands.

Furthermore, there is no apparent reason why applicant would be prevented from presenting claims corresponding to those of the instant application in the other copending application. See *In re Schneller*, 397 F.2d 350, 158 USPQ 210 (CCPA 1968). See also MPEP § 804.

Art Unit:

***Claim Rejections - 35 USC § 112***

4. Claims 89,90,93,94,102 and 103 are, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

These claims state cyclic or simultaneous inquiry of the pads. By such claiming, Applicant asserts that either or both of the cyclic or simultaneous inquiry is **not critical**. By Applicant's admission these concepts are held to not be critical and are considered as such.

The remainder of this action considers the claims as they are understood.

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 6-8, 20-22, 61, 62, 144 and 145 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Yavetz.

7. Claims 147 and 148 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Rosenhagen et al.

Art Unit:

*Claim Rejections - 35 USC § 103*

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

10. Claims 1,2,4,5,9,10,14-19,2829,33-39,43-60,86-97,100-103,108-110,129-131,136 and 137 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yavetz in view of Stern et al.

Yavetz discloses a toy set with light indicators on the controllers and transmitters for each controller. He lacks a central station for controller input. This is taught by Stern. It would have been obvious to one of ordinary skill in the art to have provided a Yavetz set with a central station, as taught by Stern, in order to save money by only requiring a single transmitter for the set, instead of the many transmitters, one for each controller.

11. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yavetz in view of Stern et al as applied to claim 2 above, and further in view of Rosenhagen et al.



Art Unit:

Yavetz, as modified, lacks the provision of any controller being able to control any vehicle, such as is taught by Rosenhagen. It would have been obvious to have provided a Yavetz toy with the ability to control any vehicle, as taught by Rosenhagen, in order to make the "conflict" more of a challenge by enabling a player to "capture" one of more of the "enemy" vehicles.

12. Claims 11-13,23-27,30-32,104-107,138,139,141,150 and 151 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rosenhagen et al in view of Stern et al.

Rosenhagen lacks the use of central station to reduce transmitters, as is taught by Stern. It would have been obvious to have provided a Rosenhagen set with a central station, as taught by Stern, in order to reduce the number of transmitters required in the set and thereby reduce costs.

13. Claims 140 and 143 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rosenhagen et al in view of Stern et al as applied to claims 139 and 142 above, and further in view of Yavetz.

Rosenhagen is silent regarding whether his vehicle has "active" lights, but this is clearly taught by Yavetz. It would have been obvious to have provided a Rosenhagen set with vehicles with "active" lights, as taught by Yavetz, in order to establish which vehicles were actually in use at any given time.

14. Claim 40 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mabuchi et al in view of Stern et al.

Mabuchi discloses dual wheeled and dual motored toys. The teachings of Stern are used in the same manner, for the same reasons as in the rejection of claim 1 above.

Art Unit:

15. Claim 41 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mabuchi in view of Stern et al as applied to claim 40 above, and further in view of Rosenhagen et al.

Mabuchi, as modified, lacks the use of pulse width modulation, such as are taught by Rosenhagen. It would have been obvious to have used a pulse width modulation for control signals in a Mabuchi toy, as taught by Rosenhagen, in order to make use of this more efficient and effective type of remote control signal.

16. Claim 42 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mabuchi et al in view of Stern et al as applied to claim 40 above, and further in view of Yang.

Mabuchi, as modified, lacks the use of the last command priority unless overridden, such as is taught by Yang. It would have been obvious to have provided a Mabuchi toy with last command priority, as taught by Yang, in order to ensure that the toy would continue to do something, or nothing, until properly given a new command.

17. Claims 63-85, 98 and 99 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yavetz in view of Stern et al and Yang.

Yavetz lacks the central station and clock generator with signal timing. The teachings of Stern are used in the same manner, for the same reasons as in the rejection of claim 1. Yang also teaches that a toy vehicle set may have a clock generator and signal timing. It would have also been obvious to have provided a Yavetz set with a clock generator and timing signals, as taught by Yang, in order to have sequential control of the output signals thereby preventing signal mixup and degradation of the toys' control. The number of lines used by any system is seen to have been an

Art Unit:

obvious choice of design, obvious to one of ordinary skill, to control and enable any chosen communications.

114-121 148, 149  
18. Claims 111-128, 132-135, 148 and 149 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yavetz in view of Stern et al and Rosenhagen et al.

Yavetz lacks the central station and any controller being able to control any vehicle. The teachings of Stern and Rosenhagen are use din the same manner, for the same reasons, as in the rejection of claim 1 and 3, respectively.

***Prior Art***


19. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Jacobson discloses a set where plural controllers each control slaved construction vehicles.

Ermrich et al discloses multiple microprocessors for toy train controls.

Any inquiry concerning this communication should be directed to D. Neal Muir at telephone number (703) 308-1206.

DNM  
July 6, 1998

  
D. Neal Muir  
Examiner  
Art Unit 3712

## NOTICE OF DRAFTSPERSON'S PATENT DRAWING REVIEW

PTO Draftpersons review all originally filed drawings regardless of whether they are designated as formal or informal. Additionally, patent Examiners will review the drawings for compliance with the regulations. Direct telephone inquiries concerning this review to the Drawing Review Branch, 703-305-8404.

The drawings filed (insert date) 2/11/97 are  
 A. ☒ not objected to by the Draftsperson under 37 CFR 1.84 or 1.152.  
 B. ☒ objected to by the Draftsperson under 37 CFR 1.84 or 1.152 as indicated below. The Examiner will require submission of new, corrected drawings when necessary. Corrected drawings must be submitted according to the instructions on the back of this Notice.

## 1. DRAWINGS. 37 CFR 1.84(a): Acceptable categories of drawings:

Black ink. Color.

☐ Not black solid lines. Fig(s) \_\_\_\_\_☐ Color drawings are not acceptable until petition is granted. Fig(s) \_\_\_\_\_

## 2. PHOTOGRAPHS. 37 CFR 1.84(b)

☐ Photographs are not acceptable until petition is granted. Fig(s) \_\_\_\_\_☐ Photographs not properly mounted (must use brylboard or photographic double-weight paper). Fig(s) \_\_\_\_\_☐ Poor quality (half-tone). Fig(s) \_\_\_\_\_

## 3. GRAPHIC FORMS. 37 CFR 1.84 (d)

☐ Chemical or mathematical formula not labeled as separate figure. Fig(s) \_\_\_\_\_☐ Group of waveforms not presented as a single figure, using common vertical axis with time extending along horizontal axis. Fig(s) \_\_\_\_\_☐ Individual waveform not identified with a separate letter designation adjacent to the vertical axis. Fig(s) \_\_\_\_\_

## 4. TYPE OF PAPER. 37 CFR 1.84(c)

☐ Paper not flexible, strong, white, smooth, nonshiny, and durable. Sheet(s) \_\_\_\_\_☐ Erasures, alterations, overwritings, interlineations, cracks, creases, and folds copy machine marks not accepted. Fig(s) \_\_\_\_\_☐ Mylar, velum paper is not acceptable (too thin). Fig(s) \_\_\_\_\_

## 5. SIZE OF PAPER. 37 CFR 1.84(f): Acceptable sizes:

21.6 cm. by 35.6 cm. (8 1/2 by 14 inches)

21.6 cm. by 33.1 cm. (8 1/2 by 13 inches)

21.6 cm. by 27.9 cm. (8 1/2 by 11 inches)

21.0 cm. by 29.7 cm. (DIN size A4)

☐ All drawing sheets not the same size. Sheet(s) \_\_\_\_\_☐ Drawing sheet not an acceptable size. Sheet(s) \_\_\_\_\_

## 6. MARGINS. 37 CFR 1.84(g): Acceptable margins:

Paper size

21.6 cm. X 35.6 cm. (8 1/2 X 14 inches)	21.6 cm. X 33.1 cm. (8 1/2 X 13 inches)	21.6 cm. X 27.9 cm. (8 1/2 X 11 inches)	21.0 cm. X 29.7 cm. (DIN Size A4)
Top (T) 2.5 cm. (1")	2.5 cm. (1")	2.5 cm. (1")	2.5 cm. (1")
Left (L) 2.5 cm. (1")	2.5 cm. (1")	2.5 cm. (1")	2.5 cm. (1")
Right (R) 2.5 cm. (1")	2.5 cm. (1")	2.5 cm. (1")	2.5 cm. (1")
Bottom (B) 2.5 cm. (1")	2.5 cm. (1")	2.5 cm. (1")	2.5 cm. (1")

☐ Margins do not conform to chart above.

Sheet(s) \_\_\_\_\_

☐ Top (T) ☐ Left (L) ☐ Right (R) ☐ Bottom (B)

## 7. VIEWS. 37 CFR 1.84(h)

REMINDER: Specification may require revision to correspond to drawing changes.

☐ All views not grouped together. Fig(s) \_\_\_\_\_☐ Views connected by projection lines or lead lines. Fig(s) \_\_\_\_\_☐ Partial views. 37 CFR 1.84(h) 2☐ View and enlarged view not labeled separately or properly. Fig(s) \_\_\_\_\_☐ Sectional views. 37 CFR 1.84 (h) 3☐ Hatching not indicated for sectional portions of an object. Fig(s) \_\_\_\_\_☐ Cross section not drawn same as view with parts in cross section with regularly spaced parallel oblique strokes. Fig(s) \_\_\_\_\_

## 8. ARRANGEMENT OF VIEWS. 37 CFR 1.84(i)

☐ Words do not appear on a horizontal, left-to-right fashion when page is either upright or turned so that the top becomes the right side, except for graphs. Fig(s) \_\_\_\_\_

## 9. SCALE. 37 CFR 1.84(k)

☐ Scale not large enough to show mechanism with crowding when drawing is reduced in size to two-thirds in reproduction. Fig(s) \_\_\_\_\_☐ Indication such as "actual size" or scale 1/2" not permitted. Fig(s) \_\_\_\_\_

## 10. CHARACTER OF LINES, NUMBERS, &amp; LETTERS. 37 CFR 1.84(l)

☐ Lines, numbers & letters not uniformly thick and well defined, clean, durable, and black (except for color drawings). Fig(s) \_\_\_\_\_

## 11. SHADING. 37 CFR 1.84(m)

☐ Solid black shading areas not permitted. Fig(s) \_\_\_\_\_☐ Shade lines pale, rough and blurred. Fig(s) \_\_\_\_\_

## 12. NUMBERS, LETTERS, &amp; REFERENCE CHARACTERS. 37 CFR 1.84(p)

☐ Numbers and reference characters not plain and legible. 37 CFR 1.84(p)(1) Fig(s) \_\_\_\_\_☐ Numbers and reference characters not oriented in same direction as the view. 37 CFR 1.84(p)(1) Fig(s) \_\_\_\_\_☐ English alphabet not used. 37 CFR 1.84(p)(2) Fig(s) \_\_\_\_\_☐ Numbers, letters and reference characters do not measure at least .32 cm. (.0125 inch) in height. 37 CFR(p)(3) Fig(s) \_\_\_\_\_

## 13. LEAD LINES. 37 CFR 1.84(q)

☐ Lead lines cross each other. Fig(s) \_\_\_\_\_☐ Lead lines missing. Fig(s) \_\_\_\_\_

## 14. NUMBERING OF SHEETS OF DRAWINGS. 37 CFR 1.84(t)

☐ Sheets not numbered consecutively, and in Arabic numerals, beginning with number 1. Sheet(s) \_\_\_\_\_

## 15. NUMBER OF VIEWS. 37 CFR 1.84(u)

☐ Views not numbered consecutively, and in Arabic numerals, beginning with number 1. Fig(s) \_\_\_\_\_☐ View numbers not preceded by the abbreviation Fig. Fig(s) \_\_\_\_\_

## 16. CORRECTIONS. 37 CFR 1.84(w)

☐ Corrections not made from prior PTO-948. Fig(s) \_\_\_\_\_

## 17. DESIGN DRAWING. 37 CFR 1.152

☐ Surface shading shown not appropriate. Fig(s) \_\_\_\_\_☐ Solid black shading not used for color contrast. Fig(s) \_\_\_\_\_

COMMENTS:



UNITED STATES DEPARTMENT OF COMMERCE  
Patent and Trademark Office  
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Washington, D.C. 20231

JUNE 04, 1997

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JUN 12 1997



\*100401461A\*

FULWIDER PATTON LEE & UTECH, LLP  
JOHN K. FITZGERALD, ESQ.  
10877 WILSHIRE BLVD., TENTH FLOOR  
LOS ANGELES, CA 90024

FULWIDER PATTON LEE & UTECH  
LOS ANGELES

ROKEN - 40907

UNITED STATES PATENT AND TRADEMARK OFFICE  
NOTICE OF RECORDATION OF ASSIGNMENT DOCUMENT

THE ENCLOSED DOCUMENT HAS BEEN RECORDED BY THE ASSIGNMENT DIVISION OF THE U.S. PATENT AND TRADEMARK OFFICE. A COMPLETE MICROFILM COPY IS AVAILABLE AT THE ASSIGNMENT SEARCH ROOM ON THE REEL AND FRAME NUMBER REFERENCED BELOW.

PLEASE REVIEW ALL INFORMATION CONTAINED ON THIS NOTICE. THE INFORMATION CONTAINED ON THIS RECORDATION NOTICE REFLECTS THE DATA PRESENT IN THE PATENT AND TRADEMARK ASSIGNMENT SYSTEM. IF YOU SHOULD FIND ANY ERRORS OR HAVE QUESTIONS CONCERNING THIS NOTICE, YOU MAY CONTACT THE EMPLOYEE WHOSE NAME APPEARS ON THIS NOTICE AT 703-308-9723. PLEASE SEND REQUEST FOR CORRECTION TO: U.S. PATENT AND TRADEMARK OFFICE, ASSIGNMENT DIVISION, BOX ASSIGNMENTS, NORTH TOWER BUILDING, SUITE 10C35, WASHINGTON, D.C. 20231.

RECORDATION DATE: 02/11/1997

REEL/FRAME: 8459/0898  
NUMBER OF PAGES: 4

BRIEF: ASSIGNMENT OF ASSIGNOR'S INTEREST (SEE DOCUMENT FOR DETAILS).

ASSIGNOR:  
DEANGELIS, PETER C.

DOC DATE: 02/07/1997

ASSIGNEE:  
ROKENBOK TOY COMPANY  
119 ABERDEEN, SUITE 7  
CARDIFF, CALIFORNIA 92007

SERIAL NUMBER: 08797188  
PATENT NUMBER:

FILING DATE: 02/11/1997  
ISSUE DATE:

JACQUELINE MOORE, EXAMINER  
ASSIGNMENT DIVISION  
OFFICE OF PUBLIC RECORDS

FORM PTO 1595

1-31-92



04-24-1997

SHEET

U.S. DEPT. OF COMMERCE

67978 U.S. PTO

02/11/97

40-581

AID

To the Honorable Commissioner of Pa.

100401461

attached original documents or copy thereof.

## 1. Name of conveying party(ies):

Peter C. DeAngelis

Additional name(s) of conveying party(ies) attached? ☐ Yes ☒ No

## 3. Nature of Conveyance:

- ☒ Assignment ☐ Merger  
☐ Security Agreement ☐ Change of Name  
☐ Other

Execution Date: February 7, 1997

## 2. Name and address of receiving party(ies):

Name: ROKENBOK TOY COMPANY

Internal Address:

Street Address: 119 Aberdeen, Suite 7

City Cardiff State CA ZIP 92007

Additional name(s) & address(es) attached? ☐ Yes ☒ No

## 4. Application number(s) or registration numbers(s):

68797188

If this document is being filed together with a new application, the execution date of the application is: 2/7/97

## A. Patent Application No.(s)

## B. Patent No.(s)

Additional numbers attached? ☐ Yes ☒ No

## 5. Name and address of party to whom correspondence concerning document should be mailed:

Name: John K Fitzgerald, Esq.

Internal Address: FULWIDER PATTON LEE &amp;

UTECHT, LLP

Street Address: 10877 Wilshire Boulevard,

Tenth Floor

City: Los Angeles State: CA ZIP 90024

6. Total No. of applications and patents involved ☐

One

## 7. Total fee (37 CFR 3.41):.....\$ 40.00

- ☒ Enclosed  
☐ Authorized to be charged to deposit account  
☒ Any deficiencies in enclosed fees

## 8. Deposit account number: 06-2425

(Attach duplicate copy of this page if paying by deposit account)

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## 9. Statement and signature.

To the best of my knowledge and belief, the foregoing information is true and correct and any attached copy is a true copy of the original document.

John K. Fitzgerald

Name of Person Signing

Signature

Feb. 11, 1997

Date

08/797188



02/11/97

ASSIGNMENT

This Assignment made by Peter C. DeAngelis of Carlsbad, California, Assignor, to Rokenbok Toy Company, a California corporation, Assignee, having a place of business at 119 Aberdeen, Suite 7, Cardiff, California 92007.

WHEREAS, Assignor has invented a new and useful SYSTEM AND METHOD FOR CONTROLLING THE OPERATION OF TOYS for which an application for United States Letters Patent has been executed by them this day; and

WHEREAS, Assignor believes herself to be the original and first inventor of the invention disclosed and claimed in said application for Letters Patent; and

WHEREAS, Assignee desires to acquire by formal, recordable assignment the entire right, title and interest in and to said invention, said application, and any Letters Patent that may be granted for said invention in the United States and throughout the world;

NOW, THEREFORE, in consideration of the sum of Ten Dollars (\$10.00) and of other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, Assignor hereby sells, assigns and transfers to Assignee, the entire right, title and interest in and to said invention, said application, and any Letters Patent that may be granted for said invention in the United States and throughout the world, including the right to file foreign applications directly in the name of the Assignee and to claim for

any such foreign applications any priority rights to which such applications are entitled under international conventions, treaties or otherwise.

Further, Assignor agrees that, upon request and without further compensation, but at no expense to Assignor, she and her legal representative(s) and assigns will do all lawful acts, including the execution of papers and the giving of testimony, that may be necessary or desirable for obtaining, sustaining, reissuing or enforcing Letters Patent in the United States and throughout the world for said invention, and for perfecting, recording or maintaining the title of Assignee, its successors and assigns, to said invention, said application, and any Letters Patent granted for said invention in the United States and throughout the world.

Assignor represents and warrants that she has not granted and will not grant to others any rights inconsistent with the rights granted herein.

Assignor authorizes and requests the Commissioner of Patents and Trademarks of the United States and of all foreign countries to issue any Letters Patent granted for said invention, whether on said application or on any subsequently filed division, continuation, continuation-in-part or reissue application, to Assignee, its successors and assigns, as the assignee of the entire interest in said invention.



IN WITNESS WHEREOF, Assignor has executed this Assignment  
on the dates written hereinbelow.

Assignor:

Date: Feb 7, \_\_\_\_\_, 1997

  
\_\_\_\_\_  
Peter C. DeAngelis

FILING RECEIPT



UNITED STATES DEPARTMENT OF COMMERCE  
Patent and Trademark Office  
ASSISTANT SECRETARY AND COMMISSIONER  
OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231

APPLICATION NUMBER	FILING DATE	GRP ART UNIT	FIL FEE REC'D	ATTORNEY DOCKET NO.	DRWGS	TOT CL	IND CL
08/797,188	02/11/97	3301	\$3,746.00	ROSTS-40907	10	151	51

*ful*  
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10877 WILSHIRE BOULEVARD  
TENTH FLOOR  
LOS ANGELES CA 90024

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Receipt is acknowledged of this nonprovisional Patent Application. It will be considered in its order and you will be notified as to the results of the examination. Be sure to provide the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION when inquiring about this application. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. If an error is noted on this Filing Receipt, please write to the Application Processing Division's Customer Correction Branch within 10 days of receipt. Please provide a copy of the Filing Receipt with the changes noted thereon.

Applicant(s)

PETER C. DEANGELIS, CARLSBAD, CA.

FOREIGN FILING LICENSE GRANTED 04/19/97

\* SMALL ENTITY \*

TITLE

SYSTEM AND METHOD FOR CONTROLLING THE OPERATION OF TOYS

PRELIMINARY CLASS: 446

**LICENSE FOR FOREIGN FILING UNDER  
Title 35, United States Code, Section 184  
Title 37, Code of Federal Regulations, 5.11 & 5.15**

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The applicant has been granted a license under 35 U.S.C. 184, if the phrase "FOREIGN FILING LICENSE GRANTED" followed by a date appears on the reverse side of this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.11. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related application(s) filed under 37 CFR 1.62 which meets the provisions of 37 CFR 5.15(a). This license is not retroactive.

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No license under 35 U.S.C. 184 has been granted at this time, if the phrase "FOREIGN FILING LICENSE GRANTED" DOES NOT appear on the reverse side of this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

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**MAR 10 1997**

**FULWIDER PATTON LEE & UTECH  
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67978 U.S. PTO  
08/397188  
Please acknowledge receipt of our APPLICATION FOR PATENT consisting of 1 title page, 54 pages of specification, 58 pages of claims, 1 page of Abstract, 10 sheets of informal drawings, 1 letter in duplicate (triplicate with assignment), Declaration and Power of Attorney (pgs.3) (Small Entity Dec.-by Small Business Concern (1)), Assignment (3pgs), and our Check No. 48981 for \$3,786 to cover the Government filing fee by affixing hereon the Patent and Trademark Office date stamp (including serial number and filing date) and returning this card to our office.

In re application of:

Inventor(s): Peter C. DeAngelis

TITLE: SYSTEM AND METHOD FOR CONTROLLING THE  
OPERATION OF TOYS

Date Mailed: February 11, 1997

Express Mail No. EM218452412US

JKF/vmm/client ID/docket: ROSTS-40907



**received**  
3/10/97

Please acknowledge receipt of our APPLICATION FOR U.S. LETTERS PATENT consisting of 1 title page, 54 pages of specification, 58 pages of claims, 1 page of Abstract, 10 sheets of informal drawings, transmittal letter in duplicate (triplicate with assignment), Declaration and Power of Attorney (pgs.3) (Small Entity Dec.-by Small Business Concern (1)), Assignment (3pgs), and our Check No. 18981 for \$3,786 to cover the Government filing fee by affixing hereon the Patent and Trademark Office date stamp (including serial number and filing date) and returning this card to our office.

In re application of:

Inventor(s): Peter C. DeAngelis

TITLE: SYSTEM AND METHOD FOR CONTROLLING THE OPERATION OF TOYS

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Date: February 11, 1997

THE COMMISSIONER OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231

Sir:

Transmitted herewith for filing is the patent application of:

Inventor: Peter C. DeAngelis

For: SYSTEM AND METHOD FOR CONTROLLING THE OPERATION OF TOYS

Enclosed are:

- ☒ 10 sheets of drawing figures. (Informal/Formal)
- ☒ An assignment of the invention to Rokenbok Toy Company
- ☐ A certified copy of a \_\_\_\_\_ application.
- ☒ An associate power of attorney.
- ☒ A verified statement to establish small entity status under 37 C.F.R. 1.9 and 37 C.F.R. 1.27.
- ☐ This application is being filed under 37 CFR § 1.53(d) without a signed Declaration or filing fee.
- The filing fee has been calculated as shown below:

(Col. 1)	(Col. 2)
FOR:	NO. FILED NO. EXTRA
BASIC FEE	
TOTAL CLAIMS	151 -20- • 131
INDEP. CLAIMS	51 -3- • 48
<input type="checkbox"/> MULTIPLE DEPENDENT CLAIM(S) PRESENTED	

\* If the difference in Col. 1 is less than zero, enter "0" in Col. 2

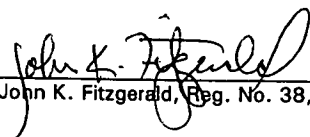
SMALL ENTITY	
RATE	FEE
	\$ 385.00
X \$ 11	\$1441.00
X \$ 40	\$1920.00
+ \$125	\$ 0
Assign. \$ 40	\$ 40.00
TOTAL	\$3786.00

OTHER THAN A SMALL ENTITY	
RATE	FEE
	\$ 770.00
X \$ 22	\$
X \$ 80	\$
+ \$260	\$
Assign. \$ 40	\$
TOTAL	\$

- ☐ Please charge my Deposit Account No. **06-2425** the amount of \$ \_\_\_\_\_. A duplicate of this sheet is enclosed.
- ☒ A check in the amount of **\$3,786.00** to cover the filing fee is enclosed.
- ☒ The Commissioner is hereby authorized to charge payment of the following fees associated with this communication or credit any overpayment to Deposit Account No. **06-2425**. A duplicate copy of this sheet is enclosed.
- ☒ Any additional filing fees required under 37 CFR 1.16.
- ☒ Any patent application processing fees under 37 CFR 1.17.
- ☐ The Commissioner is hereby authorized to charge payment of the following fees during the pendency of this application or credit any overpayment to Deposit Account No. **06-2425**. A duplicate copy of this sheet is enclosed.
- ☐ Any patent application processing fees under 37 CFR 1.17.
- ☐ The issue fee set in 37 CFR 1.18 or before mailing of the Notice of Allowance, pursuant to 37 CFR 1.311(b).
- ☐ Any filing fees under 37 CFR 1.16 for presentation of extra claims.

FULWIDER, PATTON, LEE & UTECHT, LLP  
ATTORNEYS AT LAW  
Center West  
10877 Wilshire Boulevard, Tenth Floor  
Los Angeles, California 90024

Respectfully submitted,

  
John K. Fitzgerald, Reg. No. 38,881

EXPRESS MAIL NO. EM218452412US

FITZGERALD/ROST/40907/PTO1082.211

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# RECORD, ON FORM COVER SHEET PATENTS ONLY

 U.S. DEPARTMENT OF COMMERCE  
Pat. and Trademark Office

To the Honorable Commissioner of Patents and Trademarks. Please record the attached original documents or copy thereof.

## 1. Name of conveying party(ies):

Peter C. DeAngelis

Additional name(s) of conveying party(ies) attached? ☐ Yes ☒ No

## 3. Nature of Conveyance:

☒ Assignment☐ Merger☐ Security Agreement☐ Change of Name☐ Other

Execution Date: February 7, 1997

## 2. Name and address of receiving party(ies):

Name: ROKENBOK TOY COMPANY

Internal Address: \_\_\_\_\_

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## 5. Name and address of party to whom correspondence concerning document should be mailed:

Name: John K Fitzgerald, Esq.Internal Address: FULWIDER PATTON LEE &  
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One

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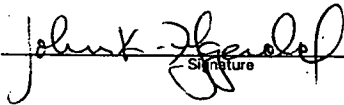
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## 9. Statement and signature.

To the best of my knowledge and belief, the foregoing information is true and correct and any attached copy is a true copy of the original document.

John K. Fitzgerald

Name of Person Signing



Signature

Feb. 11, 1997  
Date



ASSIGNMENT

This Assignment made by Peter C. DeAngelis of Carlsbad, California, Assignor, to Rokenbok Toy Company, a California corporation, Assignee, having a place of business at 119 Aberdeen, Suite 7, Cardiff, California 92007.

WHEREAS, Assignor has invented a new and useful SYSTEM AND METHOD FOR CONTROLLING THE OPERATION OF TOYS for which an application for United States Letters Patent has been executed by them this day; and

WHEREAS, Assignor believes herself to be the original and first inventor of the invention disclosed and claimed in said application for Letters Patent; and

WHEREAS, Assignee desires to acquire by formal, recordable assignment the entire right, title and interest in and to said invention, said application, and any Letters Patent that may be granted for said invention in the United States and throughout the world;

NOW, THEREFORE, in consideration of the sum of Ten Dollars (\$10.00) and of other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, Assignor hereby sells, assigns and transfers to Assignee, the entire right, title and interest in and to said invention, said application, and any Letters Patent that may be granted for said invention in the United States and throughout the world, including the right to file foreign applications directly in the name of the Assignee and to claim for

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any such foreign applications any priority rights to which such applications are entitled under international conventions, treaties or otherwise.

Further, Assignor agrees that, upon request and without further compensation, but at no expense to Assignor, she and her legal representative(s) and assigns will do all lawful acts, including the execution of papers and the giving of testimony, that may be necessary or desirable for obtaining, sustaining, reissuing or enforcing Letters Patent in the United States and throughout the world for said invention, and for perfecting, recording or maintaining the title of Assignee, its successors and assigns, to said invention, said application, and any Letters Patent granted for said invention in the United States and throughout the world.

Assignor represents and warrants that she has not granted and will not grant to others any rights inconsistent with the rights granted herein.

Assignor authorizes and requests the Commissioner of Patents and Trademarks of the United States and of all foreign countries to issue any Letters Patent granted for said invention, whether on said application or on any subsequently filed division, continuation, continuation-in-part or reissue application, to Assignee, its successors and assigns, as the assignee of the entire interest in said invention.

IN WITNESS WHEREOF, Assignor has executed this Assignment  
on the dates written hereinbelow.

Assignor:

Date: Feb 7, 1997

  
Peter C. DeAngelis

# SYSTEM AND METHOD FOR CONTROLLING THE OPERATION OF TOYS

## BACKGROUND OF THE INVENTION

### Field of the Invention

The invention relates generally to a system for pleasurable use by people of all  
5 ages with youthful minds in operating remotely controlled vehicles simultaneously in a  
somewhat confined area. More specifically, this invention relates to remotely controlled  
vehicles such as toy dump trucks that can be operated to mimic the operation of similar full-  
size vehicles having accessories for scooping up material, transferring the material to a  
hopper, and then automatically activating the hopper to dump the material. In addition, the  
10 system also includes a trailer hitch that can be remotely engaged or disengaged by controlling  
the position of the scooper.

### Description of the Related Art

Various types of play systems exist, and have existed for some time, in which  
vehicles are moved on a remotely controlled basis. Examples of a vehicle in such a system  
15 are an automobile, airplane, truck or construction vehicle. In most such systems, however,  
the functions and activities that the vehicle is capable of are limited to moving along a floor  
or along the ground or in the air.

Other types of play systems involve the use of blocks for building structures.  
These blocks often include structure for providing an interlocking relation- ship between  
20 abutting blocks. In this way, elaborate structures can be created by users with creative minds.  
Such structures are generally built by hand.

Tests have indicated that there is a desirability, and even a need, for play  
systems in which vehicles are remotely operated to perform functions other than to move  
aimlessly along a floor or along the ground. For example, tests have indicated there is a  
25 desirability, and even a need, for a play system in which the remotely controlled vehicles can

transport elements such as blocks to construct creative structures. There is also a desirability, and even a need for play systems in which a plurality of vehicles can be remotely controlled by switches in hand-held pads to compete against one another in performing a first task or to cooperate in performing a second task such as building a miniature community through the  
5 transport of miniature blocks or other suitably sized material.

Co-pending application Serial No. 08/580,753 filed by John J. Crane on December 29, 1995, for a "Remote Control System for Operating Toys" and assigned of record to the assignee of record of this application discloses and claims a play system for use by people of all ages with youthful minds. It provides for a simultaneous control by each  
10 player of an individual one of a plurality of remotely controlled vehicles. This control is provided by the operation by each such player of switches in a hand-held unit or pad, the operation of each switch in such hand-held unit or pad providing a control of a different function in the individual one of the remotely controlled vehicles. Each of the remotely controlled vehicles in the system disclosed and claimed in application 08/580,753 can be  
15 operated in a competitive relationship with others of the remotely controlled vehicles or in a co-operative relationship with others of the remotely controlled vehicles. The vehicles can be constructed to pick up and transport elements such as blocks or marbles and to deposit such elements at displaced positions.

When manually closed in one embodiment of the system disclosed and claimed  
20 in application Serial No. 08/580,753, switches in pads control the selection of toy vehicles and the operation of motors for moving the vehicles forwardly, rearwardly, to the left and to the right and moving upwardly and downwardly (and rightwardly and leftwardly) a receptacle for holding transportable elements (e.g. marbles) or blocks.

When sequentially and cyclically interrogated by a central station, each pad in  
25 the system disclosed and claimed in application Serial No. 08/580,753 sends through wires to the central station signals indicating the switch closures in such pad. Such station produces first binary signals addressing the vehicle selected by such pad and second binary signals identifying the control operations in such vehicle. Thereafter the switches identifying

in such pad the control operations in such selected vehicle can be closed without closing the switches identifying such vehicle.

The first and second signals for each vehicle in the system disclosed and claimed in application Serial No. 08/580,753 are transmitted by wireless by the central station to all of the vehicles at a common carrier frequency modulated by the first and second binary signals. The vehicle identified by the transmitted address demodulates the modulating signal and operates its motors in accordance with such demodulation. When the station fails to receive signals from a pad for a particular period of time, the vehicle selected by such pad becomes available for selection by another pad and such pad can select that vehicle or another vehicle.

A cable may couple two (2) central stations (one as a master and the other as a slave) in the system disclosed and claimed in application Serial No. 08/580,753 so as to increase the number of pads controlling the vehicles. Stationary accessories (e.g. elevator) connected by wires to the central station become operative when selected by the pads.

Co-pending application Serial No. 08/763,678, filed by William M. Barton, Jr., Peter C. DeAngelis and Paul Eichen on December 11, 1996 for a "System For And Method Of Selectively Providing The Operation Of Toy Vehicles" and assigned of record to the assignee of record of this application discloses and claims a system wherein a key in a vehicle socket closes contacts to reset a vehicle microcontroller to a neutral state. Ribs disposed in a particular pattern in the key operate switches in a particular pattern in the vehicle to provide an address for the vehicle with the vehicle inactive but powered. When the vehicle receives such individual address from an individual one of the pads in a plurality within a first particular time period thereafter, the vehicle is operated by commands from such pad. Such individual pad operates such vehicle as long as such vehicle receives commands from such individual pad within the first particular period after the previous command from such individual pad. During this period, the vehicle has a first illumination to indicate that it is being operated.

When the individual pad of the system disclosed and claimed in application Serial No. 08/763,678 fails to provide commands to such vehicle within such first particular time period, the vehicle becomes inactive but powered and provides a second illumination. While inactive but powered, the vehicle can be addressed and subsequently commanded by  
5 any pad including the individual pad, which thereafter commands the vehicle. The vehicle becomes de-activated and not illuminated if (a) the vehicle is not selected by any of the pads during a second particular time period after becoming inactivated but powered or, alternatively, (b) all of the vehicles become inactivated but powered and none is selected during the second particular period. The vehicle becomes de-activated and not illuminated.  
10 The key can thereafter be actuated to operate the vehicle to the inactive but powered state.

Co-pending application Serial No. 08/696,263, filed by Peter C. DeAngelis on August 13, 1996 for a "System And Method Of Controlling The Operation Of Toys" and assigned of record to the assignee of record of this application discloses and claims a system wherein individual ones of pads remotely control the operation of selective ones of vehicles.  
15 In each pad, (a) at least a first control provides for the selection of one of the vehicles, (b) second controls provide for the movement of the selected vehicle and (c) third controls provide for the operation of working members (e.g. pivotable bins) in the selected vehicle. Each pad provides a carrier signal, preferably common with the carrier signals from the other pads. Each pad modulates the carrier signal in accordance with the operation of the pad  
20 controls. The first control in each pad provides an address distinctive to the selected one of the vehicles and modulates the carrier signal in accordance with such address.

Each pad of the system disclosed and claimed in application 08/696,263 sends the modulated carrier signals to the vehicles in a pseudo random pattern, different for each pad, with respect to time. Each vehicle demodulates the carrier signals to recover the address  
25 distinctive to such vehicle. Each vehicle then provides a movement of such vehicle and an operation of the working members in such vehicle in accordance with the modulations provided in the carrier signal by the operation of the second and third controls in the pads selecting such vehicle. Each vehicle is controlled by an individual one of the pads for the time period that such pad sends control signals to such vehicle within a particular period of

time from the last transmission of such control signals to such vehicle. Thereafter such vehicle can be selected by such pad or by another pad.

What has been needed, and heretofore unavailable, is a play system including vehicles that are capable of being remotely operated to accomplish tasks such as lifting, scooping, dumping, leveling and hauling suitably sized materials such as marbles or small blocks, thus providing a person having a youthful mind with opportunities for realistic play and enjoyment.

### SUMMARY OF THE INVENTION

Briefly and in general terms, the present invention provides a new and improved play system for use by people of all ages with youthful minds. It provides for simultaneous control by each player of an individual one of a plurality of remotely controlled vehicles. This control is provided by the operation by each such player of switches in a hand-held unit or pad, the operation of each switch in such hand-held unit providing a control of a different function in the individual one of the remotely controlled vehicles. Each of the remotely controlled vehicles in the system of this invention can be operated in a competitive relationship with others of the remotely controlled vehicles or in a co-operative relationship with others of the remotely controlled vehicles. The vehicles can be constructed to pick up and transport elements such as blocks or marbles and to deposit such elements at displaced positions.

More specifically, when manually closed in one embodiment of the invention, switches in pads control the selection of toy vehicles and the operation of motors for moving the vehicles forwardly, rearwardly, to the left and to the right, and moving upwardly and downwardly a receptacle or bin for holding transportable elements (e.g. marbles).

The pads may be interrogated by a central station in either a sequential or parallel manner, the pads sending signals representative of switch closures in the pad to the central station over wires. The central station receives the signals from the pad, and forms



packets of data to be transmitted over radio frequencies to receivers in the toy vehicles. The central station forms the packet to have a first binary signal addressing the vehicle selected by such pad and a second binary signal identifying the control operation in such vehicle.

5 The packets of data formed by the central station are transmitted by wireless  
to all of the vehicles at a common carrier frequency modulated by the first and second binary  
signals. The vehicle identified by the transmitted address demodulates the modulating signals  
and operates its motors in accordance with such demodulation. When the station fails to  
receive signals from a pad for a particular period of time, the vehicle selected by such pad  
becomes available for selection by another pad and such pad can select that vehicle or another  
10 vehicle.

The pads also include a switch to set the pad into a mode wherein a second pad  
may also select and control the vehicle selected by the first pad. Another novel aspect of the  
present invention is the inclusion of a flashback capability that may also be sensitive to the  
setting of the mode of a pad. When a pad has been de-selected because the central station  
15 has failed to receive commands from the pad for a particular period of time, pushing any  
button on the de-selected pad will cause the central station to attempt to select the last vehicle  
controlled by the pad. If this attempt fails because the vehicle is already selected by another  
pad, and that pad's mode is not set to allowing sharing of control of the vehicle, the central  
station attempts to select the second to last vehicle controlled by the de-selected pad. If this  
20 second attempt fails, the central station may automatically to attempt to select each of the toy  
vehicles in sequence until one such vehicle has been selected. When the mode switch of the  
pad of a vehicle that is already selected is set in the control sharing mode, the vehicle may  
be automatically selected by the de-selected pad.

25 When a vehicle has received no packets of data addressed to it for a particular  
time, the vehicle may enter a powered, but inactive state. The receiver of the vehicle may  
remain in the powered, but inactive state until it receives at least two identical commands  
addressed to the particular vehicle.

A novel aspect of the present invention is the wiring and programmable logic device used to couple the pad to the central station. All of the signals transmitted by the pads and central station between the pads and central station are transmitted over only three wires. The particular arrangement of wires allows all of the pads connected to the central station to  
5 be interrogated either simultaneously or sequentially, and for signals to be sent to the pads by the central station selectively. The programmable logic in the pads includes shift registers for shifting the status of switch closures to the central station over the three wires, and also for shifting signals received from the central station to a bank of light emitting diodes to update the status of the light emitting diodes.

10 In another aspect of the invention, the central station includes a smart port. In this arrangement, all of the signals from the pads may be routed through the smart port to an accessory connected to the smart port by a cable. In one embodiment, this accessory may be another central station, such that the second central station is a slave to the first central station to increase the number of pads controlling the vehicles. In another embodiment, this  
15 accessory may operate upon the signals received through the smart port before returning the altered signals to the central station to be transmitted to the vehicles. In this manner, the actions of one or more, and also all, of the switches of the pads may be reprogrammed to cause the vehicle or other toy selected by the pad to carry out actions different from the actions normally controlled by the pads. This allows for future upgrading of the toy vehicles  
20 or the use of other radio controlled toys, including changing the game environment to include other types of competitive or co-operative play, such as a hockey game without replacing the central station.

25 In another aspect of the invention, when one of the switches controlling the motion of one or more of the motors of a selected vehicle is actuated for a particular time, the motor will be controlled at a first speed upon actuation of the switch, and then at a second speed if the actuation exceeds the particular time. Actuating the switch even longer may energize the motor to run at a third speed. If another of the motors of the vehicle are energized by actuating a switch on the pad, the other motor will start up at the same speed as the motor that is already energized.

In another aspect of the present invention, the motors of the vehicle may be driven by pulse wave modulated signals for a particular duty cycle. When such a motor is first energized, the pulse width modulation signal is asserted during a first portion of the duty cycle. This ensures that switch actuations on the pad to control the motion of the vehicle selected by the pad will be effectuated as rapidly as possible, thus enhancing the ability of a user to control the vehicle in tight positions.

In still another aspect of the present invention, the central station prioritizes the transmission of packets to the vehicles to reduce lag time between switch actuation and vehicle motion. In this aspect, the central station continuously and sequentially transmits packets to all of the vehicles, including packets having no signals. This stream of packets is interpreted by the receivers of the vehicle as representing a powered on state for the central station, even if no signals to control any of the motors of any of the vehicles is included in the packets. When a switch is actuated on a pad, the central station forms a packet of data to be transmitted to the vehicle representative of the state of the switch closures of such pad. This packet is inserted into the stream of continuously transmitted packets at the earliest possible time, even if the packet is inserted out of sequential order.

These and other features and advantages of the invention will become apparent from the following detailed description when taken in conjunction with the accompanying exemplary drawings.

#### BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a schematic diagram, primarily in block form, of a system constituting one embodiment of the invention;

Figure 2 is a schematic diagram, primarily in block form, of the different features in a pad included in the system shown in Figure 1;

Figure 3 is a schematic diagram, primarily in block form of the different features included in a central station included in the system shown in Figure 1;

Figure 4 is a schematic diagram, primarily in block form, of the different features in a vehicle included in the system shown in Figure 1;

5                Figure 5 is a block diagram illustrating an arrangement of binary bits within a packet transmitted by the radio frequency transmitter of Figure 2;

Figure 6 is a schematic diagram illustrating a representative timing of a signal transition in (a) a bit having a value of binary 0 and (b) a bit having a value of binary 1 of bits in the packet shown in Figure 5;

10              Figure 7 is a schematic diagram, primarily in block form, showing the details of a plurality of signal lines connecting the pads to the central station;

Figure 8 is a schematic diagram, primarily in block form, of a programmable logic device in the pads; and

15              Figure 9 is a schematic diagram illustrating timing and transition of signals within the programmable logic device of Figure 8;

Figure 10 is a schematic diagram, primarily in block form, of a serial interface connecting an accessory to the central station of Figure 1; and

Figure 11 is a schematic diagram illustrating timing and transition of signals within the serial interface of the Figure 10.

Description of the Preferred Embodiments

The drawings will now be described in more detail, wherein like referenced numerals refer to like or corresponding elements among the several drawings. Moreover, reference may be made to United States patent applications Ser. No. 08/580,753, Ser. No. 08/763,678 and Ser. No. 08/696,263, which are hereby incorporated in their entirety.

Referring now to Figure 1, one embodiment of a system 10 is generally depicted for controlling the selection and operation of a plurality of toy vehicles. Illustrative examples of toy vehicles constitute a dump truck generally indicated at 12, a fork lift generally indicated at 14, a skip loader generally indicated at 16 and another form of skip loader generally indicated at 17. The toy vehicles such as the dump truck 12, the fork lift 14 and the skip loaders 16 and 17 are simplified versions of commercial units performing function similar to those performed by the toy vehicles 12, 14, 16 and 17. For example, the dump truck 12 may include a working or transport member such as a pivotable bin or container 18; the fork lift 14 may include a working or transport member such as a pivotable platform or grasping arm 20; the skip loader 16 may include a working or transport member such as a pivotable bin or container 22 disposed at the front end of the skip loader; and the skip loader 17 may include a working or transport member such as a pivotable bin or container 23 disposed at the rear end of the skip loader. The working or transport members such as the pivotable bin or container 18, the pivotable platform 20 and the pivotable bins or containers 22 and 23 are constructed to carry storable and/or transportable elements such as blocks 24 or marbles 26 shown schematically in Figure 1.

It will be understood that the toy vehicles 12, 14, 16 and 17 are for illustration purposes only, and a variety of alternative forms are possible. Such alternative forms may be, for example only, and not limited to, various combinations of features. For example, a transport member such as the pivotable bin or container 22, here shown as a scoop 27, such as is disposed at the front end of the skip loader 16 may alternatively be disposed at the front end of a dump truck 25 such that the transport member or scoop 27 may pick up and/or

transport storable and/or transportable elements and/or drop the storable and/or transportable elements into the pivotable bin or container 29 of the dump truck 25.

Each of the toy vehicles 12, 14, 16, 17 and 25 may also have a trailer hitch 19 mounted on the front or rear of the vehicle for hooking a hitch member of another vehicle, such as a trailer (not shown) to the hitch 19 of the vehicles 12, 14, 16, 17 and 25. The trailer hitch 19 may be remotely controlled in similar fashion to the working or transport member of the toy vehicle. Alternatively, the trailer hitch may be mechanically interconnected with the working or transport member such that remote control of the working or transport member also controls the trailer hitch 19.

Each of the dump trucks 12 and 25, the fork lift 14 and the skip loaders 16 and 17 may include a plurality of motors. For example, the dump truck 12 may include a pair of reversible motors 28 and 30 (Figure 4) operable to move the dump truck forwardly, rearwardly, to the right and to the left. The motor 28 controls the movement of the front and rear left wheels and the motor 30 controls the movement of the front and rear right wheels.

When the motors 28 and 30 are simultaneously operated in one direction, the dump truck 12 moves forwardly. The vehicle 12 moves rearwardly when the motors 28 and 30 are moved in the opposite direction. The vehicle 12 turns toward the right when the motor 30 is operated without simultaneous operation of the motor 28. The vehicle 12 turns toward the right when the motor 28 is operated without a simultaneous operation of the motor 30.

The vehicle 12 spins to the right when the motor 30 operates to move the vehicle forwardly at the same time that the motor 28 operates to move the vehicle rearwardly. The vehicle 12 spins to the left when the motors 28, 30 are operated in directions opposite to the operations of the motors in spinning the vehicle to the right.

Another reversible motor 32 in the dump truck 12 operates in one direction to pivot the bin 18 upwardly and in the other direction to pivot the bin downwardly. Alternatively, in the embodiment of the dump truck having a scoop 27 disposed at the front

of the dump truck 25, the reversible motor 32 operates to lift the scoop 27 upwardly and then rearwardly to lift, transport, and then spill the contents of the scoop 27 into the pivotable bin or container 29 of the dump truck 25. Continued rotation of the motor 32 may also operate to then pivot the bin 29 upwardly to spill the contents of the bin 29 out of the rear of the bin 29. In yet another embodiment, continued rotation of the motor 32 may cause the trailer hitch 19 to open. When the motor 32 is operated in the other direction, the trailer hitch 19 closes, the bin 29 pivots downwardly, and the scoop 27 pivots forwardly and downwardly. An additional motor 33 may operate in one direction to turn the bin 29 to the left and in the other direction to turn the bin 29 to the right.

10           The construction of the motors 28, 30 32 and 33 and the disposition of the motors in the dump trucks 12 and 25 to operate the dump trucks are considered to be well known in the art. The fork lift 14 and the skip loaders 16 and 17 may include motors corresponding to those described above for the dump trucks 12 and 25.

15           The system 10 may also include stationary plants or accessories. For example, the system 10 may include a pumping station generally indicated at 34 (Figure 1) for pumping elements such as the marbles 26 through a conduit 36. The system may also include a conveyor generally indicated at 38 for moving the elements such as the marbles 26 upwardly on a ramp 40. When the marbles 26 reach the top of the ramp 40, the elements such as the marbles 26 may fall into the bin 18 in the dump truck 12 or into the bin 22 in the skip loader 16. For the purposes of this application, the construction of the pumping station 34 and the conveyor 38 may be considered to be within the purview of a person of ordinary skill in the art.

25           The system 10 may also include a plurality of hand-held pads generally indicated at 42a, 42b, 42c and 42d (Figure 1). Each of the pads 42a, 42b, 42c and 42d may have substantially identical construction. Each of the pads may include a plurality of actuatable buttons. For example, each of the pads may include a 4-way button 44 in the shape of a cross. Each of the different segments in the button 44 is connected to an individual one of a plurality of switches 46, 48, 50 and 52 in Figure 2.

When the button 44 is depressed at the segment at the top of the button, the switch 46 is closed to obtain the operation of motor 28 and 30 (Figure 4) in moving the selected one of the vehicle 12 forwardly. Similarly, when the segment at the bottom of the button 44 is depressed, the switch 48 is closed to obtain the operation of motors 28 and 30 (Figure 4) in moving the vehicle 12 rearwardly. The selective depression of the right and left segments of the button 44 cause the motors 28 and 30 to operate in turning the selected vehicle toward the right and the left.

It will be appreciated that pairs of segments of the button 44 may be simultaneously depressed. For example, the top and left portions of the button 44 may be simultaneously depressed to obtain a simultaneous movement of the vehicle 12 forwardly and to the left. However, a simultaneous actuation of the top and bottom segments of the button 44 will not have any effect since they represent contradictory commands. This is also true of a simultaneous depression of the left and right segments of the button 44.

Each of the pads 42a, 42b, 42c and 42d may include a button 56 (Figure 1) which is connected to a switch 57 (Figure 2). Successive depressions of the button 56 on one of the pads within a particular period of time cause different ones of the stationary accessories or plants such as the pumping station 34 and the conveyor 38 to be energized. For example, a first depression of the button 56 in one of the pads 42a, 42b, 42c and 42d may cause the pumping station 34 to be energized and a second depression of the button 56 within the particular period of time in such pad may cause the conveyor 38 to be energized. When other stationary accessories are include in the system 10, each may be individually energized by depressing the button 56 a selective number of times within the particular period of time. When the button 56 is depressed twice within the particular period of time, the energizing of the pumping station 34 is released and the conveyor 38 is energized. This energizing of a selective one of the stationary accessories occurs at the end of the particular period of time.

A button 58 is provided in each of the pads 42a, 42b, 42c and 42d to select one of the vehicles 12, 14, 16 and 17. The individual one of the vehicles 12, 14, 16 and 17 selected at any instant by each of the pads 42 a, 42b, 42c and 42d is dependent upon the



number of times that the button is depressed in that pad within a particular period of time. For example, one depression of the button 58 may cause the dump truck 12 to be selected and two sequential selections of the button 58 within the particular period of time may cause the fork lift 14 to be selected.

5                   Every time that the button 58 is actuated or depressed within the particular period of time, a switch 59 (in Figure 2) is closed. The particular period of time for depressing the button 58 may have the same duration as, or a different time than, the particular period of time for depressing the button 56. An adder is included in the pad 42 to count the number of depressions of the button 58 within the particular period of time. This  
10                   count is converted into a plurality of binary signals indicating the count. The count is provided at the end of the particular period of time. Each individual count provides for a selection of a different one of the vehicles 12, 14, 16, 17 and 25. The count representative of the selection of one of the vehicles 12, 14, 16, 17 and 25 may be maintained in a memory, which may be located either in the pads 42a, 42b, 42c and 42d, or in the central station 64.

15                   Buttons 60a and 60b are also included on each of the pads 42a, 42b, 42c and 42d. When depressed, the buttons 60a and 60b respectively close switches 62a and 62b in Figure 2. The closure of the switch 62a is instrumental in producing an operation of the motor 32 in a direction to lift the bin 18 in the dump truck 12 when the dump truck has been selected by the proper number of depressions of the button 58. In like manner, when the  
20                   dump truck has been selected by the proper number of depressions of the switch 58, the closure of the switch 62b causes the selective one of the bin 18 in the dump truck 12, the platform 20 in the fork lift 14 and the bin 22 in the skip loader 16 and the bin 23 in the skip loader 17 to move downwardly as a result of the operation of the motor 32 in the reverse direction. Similarly, where the dump 25 includes a scoop 27, actuation of switch 62a operates  
25                   motor 32 in a direction to lift the scoop 27 upwardly and then rearwardly, and, where the scoop 27 and the bin 29 are interconnected, causes the bin 29 to pivot upwardly. In like manner, actuation of the switch 62b causes the bin 29 to move downwardly, and the scoop 27 to move forwardly and downwardly as a result of the operation of the motor 32 in the reverse direction.

It will be appreciated that other controls may be included in each of the pads 42a, 42b, 42c and 42d. For example, buttons 61a and 61b may be included in each of the pads 42a, 42b, 42c and 42d to pivot the bin 18 to the right or left when the vehicle 12 has been selected. Such movements facilitate the ability of the bin 18 to scoop elements such as blocks 24 and marbles 26 upwardly from the floor or ground or from any other position and to subsequently deposit such elements on the floor or ground or any other position. It will be appreciated that different combinations of buttons may be actuated simultaneously to produce different combinations of motions. For example, a bin in a selected one of the vehicles may be moved at the same time that the selected one of the vehicles is moved.

Switch 65 is provided in the pads 42a, 42b, 42c and 42d to select the mode of control sharing among the pads 42a, 42b, 42c and 42d. As will be described more fully below, when switch 65 is positioned in a first position to set, for example, pad 42a in a first mode, the toy vehicle that is selected and energized by the pad 42a may be controlled only by actuating the buttons on the pad 42a. No other pad, such as pads 42b, 42c or 42d may control the operation of the vehicle selected by pad 42a. If, however, the operator of pad 42a sets pad 42a in a second mode by switching switch 65 to a second position, the toy vehicle, for example dump truck 12 controlled by pad 42a may also be controlled by any or all of pads 42b, 42c or 42d. In this manner, the operator using pad 42a may grant the operators of any or all of pads 42b, 42c or 42b the ability to control the toy vehicle selected by 42a. The operator of pad 42a, however, may not control any toy vehicle selected by any other of pads 42b, 42c or 42d unless such other one, or all, of those pads is also set in the second mode by positioning the switch 65 of a particular pad in the second position.

Buttons 47 and 49 are also included on each of the pads 42a, 42b, 42c and 42d. When depressed, the button 47 closes switch 53 and button 49 closes switch 51. The functions of switches 51 and 53 will be described more fully below.

A central station generally indicated at 64 in the Figure 1 processes the signals from the individual ones of the pads 42a, 42b, 42c and 42d and sends the processed signals to the vehicles 12, 14, 16, 17 and 25 when the button 58 on an individual one of the pads has

been depressed to indicate that the information from the individual ones of the pads is to be sent to the vehicles. The transmission may be on a wireless basis from an antenna 68 (Figure 1) in the central station to antennas 69 on the vehicles.

5 The transmission may be in packets of signals. This transmission causes the selected ones of the vehicles 12, 14, 16, 17 and 25 to perform individual ones of the functions directed by the depression of the different buttons on the individual ones of the pads. When the commands from the individual ones of the pads 42a, 42b, 42c and 42d are to pass to the stationary accessories 34 and 38 as a result of the depression of the buttons 56 on the individual ones of the pads, the central station processes the commands and sends signals  
10 through cables 70 to the selected ones of the stationary accessories.

Figure 2 shows the construction of the pad 42a in additional detail. It will be appreciated that each of the pads 42b, 42c and 42d may be constructed in a substantially identical manner to that shown in Figure 2. As shown in Figure 2, the pad 42a includes the switches 46, 48, 50 and 52 and the switches 51, 53, 57, 59, 62a, 62b, 63a, 63b and 65. Buses  
15 74 are shown as directing indications from the switches 46, 48, 50, 51, 52, 53, 57, 59, 62a, 62b, 63a, 63b and 65 to a microcontroller generally indicated at 76 in Figure 2. Buses 78 are shown for directing signals from the microcontroller 76 to the switches.

The microcontroller 76 is shown as including a read only memory (ROM) 80 and a random access memory (RAM) 82. Such a microcontroller may be considered to be  
20 standard in the computing industry. However, the programming in the microcontroller and the information stored in the read only memory 80 and the random access memory 82 are individual to this invention.

The read only memory 80 stores permanent information and the random access memory stores volatile (or impermanent) information. For example, the read only memory  
25 80 may store the sequence in which the different switches in the pad 42a provide indications of whether or not they have been closed. The random access memory 82 may receive this sequence from the read only memory 80 and may store indications of whether or not the

switches in the particular sequence have been closed for each individual one of the pads 42a, 42b, 42c and 42d.

5 The pads 42a, 42b, 42c and 42d are respectively connected to the central station 64 by cables 66a, 66b, 66c and 66d (Figure 1). These cables have, for example, five conductors or lines encased within an exterior protective sheath. It will be apparent that the structure of cables 66a, 66b, 66c and 66d, and the functions of that structure, are identical for each of the cables 66a, 66b, 66c and 66d. Thus, only the cable 66a, and its operation in conjunction with pad 42a and the central station 64, will be described.

10 The central station provides a clock signal, SCLK to the pad 42a over line 86 of cable 66a. A second line, line 84, in cable 66a, carries interrogation signals from the central station 64 to the pad 42a. The pad 42a transmits signals over line 88 (SDATA) of cable 66a to the central station 64 in response to a combination of the interrogation signal transmitted by the central station 64 to the pad 42a over line 84 and the clock signal transmitted to the pad 42a by the central station 64 over line 86. Thus, only three lines in  
15 each one of cables 66a, 66b, 66c and 66c are used for interrogation of the pad 42a and communication of data by the pad 42a to the central station 64. A more detailed description of the interrogation and data transmission process will be provided below.

A fourth line in cable 66a provides electrical power to the pad 42a from the central station 64. A fifth line in cable 66a serves as a common ground connection between  
20 the pad 42a and the central station 64.

The pad 42a in Figure 2 receives the interrogating signals from the central station 64 through line 84. These interrogating signals are not synchronized by clock signals on line 86. Each of the interrogating signals intended for the pad 42a may be identified by an address individual to such pad. When the pad 42a receives such interrogating signals, it  
25 sends to the central station 64 through line 88 a sequence of signals indicating the status of the successive ones of the switches 46 48, 50 and 52 and the switches 51, 53, 57, 59 62a, 62b, 63a, 63b and 65. These signals are synchronized by the clock signals on the line 86.

It will be appreciated that the status of each of the switches 57 and 59 probably is the first to be provided in the sequence since these signals indicate the selection of the stationary accessories 34 and 38 and the selection of the vehicles 12, 14, 16, 17 and 25.

5           The pads 42a, 42b, 42c and 42d include an array of a plurality of light emitting diodes (LED) generally indicated at 93. These light emitting diodes 93 provide a visual indication of which one of the vehicles 12, 14, 16, 17 and 25 has been selected by the operator of a particular pad. The pads 42a, 42b, 42c and 42d may be connected to the central station 64 by plugging the end of the respective one of cables 66a, 66b, 66c and 66d into one of the ports on the central station 64 provided for that purpose. When the power is provided  
10       to the central station 64 and the system 10 is turned on, the start up state of the system 10 is such that none of the vehicles 12, 14, 16, 17 and 25 is selected by any of the pads 42a, 42b, 42c and 42d. Accordingly, the array of light emitting diodes 93 on each of the pads 42a, 42b, 42c and 42d may provide an indication on each pad that no vehicle has been selected by the operator of that pad. Such an indication may be, for example, providing a signal to the first  
15       individual light emitting diode 93 in the array for a predetermined period of time to light the light emitting diode 93, removing the signal, causing the lighted light emitting diode to be extinguished, and then providing the signal to the next individual light emitting diode 93 in the array. This process is continued, lighting each of the individual light emitting diodes 93 in turn until all of the light emitting diodes have been illuminated or until button 58 has been  
20       depressed, actuating switch 59 to select one of the vehicles 12, 14, 16, 17 and 25. If all of the light emitting diodes 93 in the array have been illuminated, and the button 58 has not been depressed by the operator, the first light emitting diode 93 in the array will again be illuminated, followed by the second light emitting diode, and so on as described above.

          It may also happen that the system 10 is in use by one or more operators at the  
25       time an additional operator desires to also use the system, but not all of the pads 42a, 42b, 42c and 42d are connected to the central station 64. Thus, one of the pads 42a, 42b, 42c and 42d may need to be connected to the central station while the system 10 is in use to accommodate the additional operator. One advantage of the present invention is that an additional one or more of the pads 42a, 42b, 42c and 42d may be connected to the central

station 64 while the system 10 is in use without powering down the system 10. The central station 64 is capable of detecting the additional one or more of the pads 42a, 42b, 42c and 42d when it is connected to the central station 64, initialize the newly connected one or more of the pads 42a, 42b, 42c and 42d, and cause the light emitting diodes 93 of the newly  
5 connected pad to indicate that none of the vehicles 12, 14, 16, 17 and 25 have been selected by the newly connected pad.

Alternatively, an operator may disconnect one of the pads 42a, 42b, 42c and 42d from the central station 64 while the system 10 is in use and others of the pads 42a, 42b, 42c and 42d are being used. When the pad is disconnected, the central station 64  
10 automatically detects that the pad is disconnected and transmits a signal to the vehicle selected by the disconnected pad causing the vehicle to indicate that it is now available for selection by another one of the pads 42a, 42b, 42c and 42d that remain connected to the central station 64. When a vehicle is being controlled by more than one pad, such as when one of the pads controlling the vehicle is in the second mode as described previously, disconnection of one  
15 of the pads will not affect the control of the vehicle by the remaining, connected pad.

As previously indicated, the pad 42a selects one of the vehicles 12, 14, 16, 17 and 25 in accordance with the number of closings of the switch 59. As the user of the pad 42a provides successive actuations or depressions of the button 58, signals are introduced to a shift register 90 through a line 92 to indicate which one of the vehicles 12, 14, 16, 17 and  
20 25 would be selected if there were no further depressions of the button. Each one of the depressions of the button 58 causes the indication to be shifted to the right in the shift register 90. Such an indication is provided on an individual one of the plurality of light emitting diodes (LED) 93. The shifting of the indication in the shift register 90 may be synchronized with a clock signal on a line 95. Thus, the illuminated one of the light emitting diodes 93  
25 at each instant indicates at that instant the individual one of the vehicles 12, 14, 16, 17 and 25 that the pad 42a has selected at such instant.

The central station 64 is shown in additional detail in Figure 3. It includes a microcontroller generally indicated at 94 having a read only memory (ROM) 96 and a random

access memory (RAM) 98. As with the memories in the microcontroller 76 in the pad 42a, the read only memory 96 stores permanent information and the random access memory 98 stores volatile (or impermanent) information. For example, the read only memory 96 sequentially selects successive ones of the pads 42a, 42b, 42c and 42d to be interrogated on a cyclic basis. The read only memory 96 also stores a plurality of addresses each individual to a different one of the vehicles 12, 14, 16, 17 and 25.

Since the read only memory 96 knows which one of the pads 42a, 42b, 42c and 42d is being interrogated at each instant, it knows the individual one of the pads responding at that instant to such interrogation. The read only memory 96 can provide this information to the microcontroller 94 when the microcontroller provides for the transmittal of information to the vehicles 12, 14, 16, 17 and 25. Alternatively, the microcontroller 76 in the pad 42a can provide an address indicating the pad 42a when the microcontroller sends the binary signals relating to the status of the switches 46, 48, 50 and 52 and the switches 51, 53, 57, 59, 62a, 62b, 63a, 63b and 65 to the central station 64.

As an example of the information stored in the random access memory 98 in Figure 3, the memory stores information relating to each pairing between an individual one of the pads 42a, 42b, 42c and 42d and a selective one of the vehicles 12, 14, 16, 17 and 25 in Figure 1 and between each individual one of such pads and a selective one of the stationary accessories 34 and 38. The random access memory 98 also stores the status of the operation of the switches 46, 48, 50 and 52 for each pad and the operation of the switches 51, 53, 57, 59, 62a, 62b, 63a, 63b and 65 for each pad.

When the central station 64 receives from the pad 42a the signals indicating the closure (or the lack of closure) of the switches 46, 48, 50 and 52 and the switches 51, 53, 57, 59, 62a, 62b, 63a, 63b and 65, the central station retrieves from the read only memory 96 the address of the individual one of the vehicles indicated by the closures of the switch 59 in the pad. The central station may also retrieve the address of the pad 42a from the read only memory 96.

The central station 64 then formulates in binary form a composite address identifying the pad 42a and the selected one of the vehicles 12, 14, 16, 17 and 25 and stores this composite address in the random access memory 98. The central station 64 then provides a packet or sequence of signals in binary form including the composite address and including  
 5 the status of the opening and closing of each of the switches in the pad 42a. This packet or sequence indicates in binary form the status of the closure of each of the switches 46, 48, 50 and 52 and the switches 51, 53, 57, 59, 62a, 62b, 63a, 63b and 65.

Each packet of information including the composite addresses and the switch closure information for the pad 42a is introduced through a line 102 (Figure 3) to a radio  
 10 frequency transmitter 104 in the central station 64. The radio frequency transmitter 104 is enabled by a signal passing through a line 106 from the microcontroller 94.

When the radio frequency transmitter 104 receives the enabling signal on the line 106 and the address and data signals on the line 102, the antenna 68 (also shown in Figure 1) transmits signals to all of the vehicles 12, 14, 16, 17 and 25. The signals are  
 15 transmitted to the vehicles 12, 14, 16, 17 and 25 at the same frequency. In a preferred embodiment, the microcontroller 94 provides enabling signals to the radio frequency transmitter 104 causing the radio frequency transmitter 104 to transmit a continuous stream of packets 200 through the antenna 68 at all times that the central station 64 is powered up, including when none of the pads 42a, 42b, 42c and 42d has selected any of the vehicles 12,  
 20 14, 16, 17 and 25. However, the individual one of the vehicles 12, 14, 16, 17 and 25 will only respond to packets of signals from the central station 64 having the address associated with that vehicle.

Referring now to Fig. 5, a typical packet or sequence 200 is described. As will described more fully below, the packet 200 is a sequence of signals in binary form that are  
 25 transmitted by the central station 64 using radio frequencies to receivers included in each of the vehicles 12, 14, 16, 17 and 25. Each packet 200 of signals transmitted by the central station 64 includes a pair of start bits or signals 202, 204. These start bits 202, 204 are a signal that the following 16 bits of information contain commands in binary form



representative of the status of the closure of each of the switches 46, 48, 50 and 52 and the switches 51, 53, 59, 62a, 62b, 63a, and 63b. Each packet 200 is thus defined by the start bits 202, 204, and includes all of the bits beginning with the first start bit 202 and terminating with the sixteenth and last data bit. The packet thus contains a total of eighteen bits. The  
5 packets are transmitted continuously by the radio frequency transmitter 104 while the central station is turned on. The first start bit 202 is transmitted immediately after the transmission of the sixteenth data bit. There is no time interval between the end of one packet and the beginning of the next packet transmitted.

One possible sequencing of the binary signals comprising the packet 200 is  
10 depicted in Fig. 5. The first four bits of binary information following the start bits 202 and 204, bits 206, 208, 210 and 212, form a composite address identifying the selected one of the vehicles 12, 14, 16, 17 and 25. The four bits of binary information may be either a binary 1 or a binary 0. Thus, in the embodiment of the invention using four bits 206, 208, 210 and 212 to compose unique vehicle addresses, sixteen unique combinations of binary information  
15 that may be used to identify as many as sixteen individual vehicles are possible.

Following the identification bits 206, 208, 210 and 212 are 11 bits of binary information that reflect the status of switch closures on the pad 42a. For example, when switch 46 is closed by an operator depressing button 44 to control the selected one of the vehicles 12, 14, 16, 17 and 25 to move forward, bit 214 will be a binary 1. If the operator  
20 has released button 44, or depressed button 44 in such a manner that switch 46 is no longer closed, bit 214 will be a binary 0. Similarly, actuating button 44 to close switch 48 results in bit 216 to be a binary 1; actuating switch 50 causes bit 218 to be a binary 1; actuating switch 52 causes bit 220 to be a binary 1. Actuating button 60a to lift a bin, for example bin 18, closes switch 62a and causes the value of bit 222 to be a binary 1. Similarly, actuating  
25 button 60b to lower bin 18 closes switch 62b and causes the value of bit 224 to be a binary 1. Actuating button 61a to pivot bin 8 to the right, or close the grip of the fork lift 14 closes switch 63a and causes the value of bit 226 to be a binary 1. Actuating button 61b to pivot bin 18 to the left, or to open the grip of the fork lift 14 closes switch 63b and causes the value of bit 228 to be a binary 1.

One unique capability of the system of the present invention is the incorporation of a shift button 49. When the "shift" button 49 is depressed, actuating switch 51, in conjunction with the simultaneous depression of one of buttons 60a, 60b, 61a and 61b, the microcontroller 94 may interpret the simultaneous depressions of shift button 49 and one  
5 of the other buttons as a shifted command, and cause the value of bit 230 to be a binary 1. Similarly, simultaneous depression of button 47, closing switch 53, and any one of buttons 60a, 60b, 61a and 61b will be interpreted by the microcontroller 94 of the central station 64 as a second shifted command. The microcontroller will then set the value of bit 232 to a binary 1.

10 The final bit of the packet 200 is bit 236. Unlike the other data bits in the packet 200, bit 236 is reserved for use by an accessory connected to the smart port 115. This bit may be set by the microcontroller in an accessory connected to the smart port 115 to control the microcontroller 94 of the central station 64 to cause an action to take place, such as energizing a sound board to simulate, for example, the firing of a gun or the sounding of  
15 a train whistle or a truck horn. As will be more fully described below, various accessories or another central station 64b may be connected to the central station 64 through the smart port or adaptor 115. These accessories or additional central station may alter the processing of the signals received from the pad 42a by the microcontroller 94 of the central station 64, such that the binary values of the bits of the packet 200 may be representative of commands  
20 to carry out different functions for the buttons of the pad 42a than have been described previously.

In its simplest embodiment, the packet 200 comprises a pair of start bits 202, 204 followed by sixteen data bits, each data bit having a value of binary 0, that are repeatedly transmitted by the radio frequency transmitter at a predetermined frequency or rate. The  
25 interval of time between successive pairs of start bits 202, 204 also determines the duration of the sixteen data bits within the packet. Thus, the bit duration of each of the sixteen data bits following the start bits 202, 204 is a value equal to the interval of time between pairs of start bits 202, 204 in the stream of packets 200 divided by sixteen, the number of data bits in each packet 200.

Because the output of the radio frequency transmitter 104 is RF energy, it is necessary to encode the packet of energy comprising an individual packet 200 accordingly to represent the binary values of each of the individual ones of the bits comprising the packet 200. In one encoding scheme, a binary 0 may be represented by a transition from low to high at a particular time within the bit duration. This is illustrated at 401 in Figure 6. A binary 1 may be represented by causing the transition from high to low to take place at a different time within the bit duration. This is illustrated at 403 in Figure 6. Similarly, the start bits 202, 204 may a transition from high to low that occurs at a specific time within the bit duration that is different from any other bit that may be transmitted by the radio frequency transmitter 104 of the central station 64. Thus, the transmitter 104 may form packets 200 by simply transmitting a repetitive series of high to low transitions, substituting a pair of start bits 202, 204 for the high to low transitions at a frequency equal to the packet duration.

The microcontroller 94 stores in the random access memory 98 the individual ones of the vehicles such as the vehicles 12, 14, 16, 17 and 25 being energized at each instant by the individual ones of the pads 42a, 42b, 42c and 42d. Because of this, the central station 64 is able to prevent the interrogated one of the pads 42a, 42b, 42c and 42d from selecting one of the energized vehicles when the pad 42 that had previously selected the energized vehicle has been placed in the first mode by the operator by placing switch 65 in the first position. Thus, for example, if the vehicle 14 is being energized by one of the pads 42a, 42b, 42c and 42d at a particular instant, a first depression of the button 58 in the pad being interrogated at that instant will cause the vehicle 12 to be initially selected and a second depression of the button by such pad will cause the vehicle 14 to be skipped and the vehicle 16 to be selected. If, however, the operator of the pad 42 energizing a particular vehicle at a particular instant has been placed in the second mode by placing the switch 65 in the second position, a first depression of the button 58 in another pad being interrogated at that instant will cause the vehicle 12 to be initially selected, and the second depression of the button by such pad will not skip vehicle 14, but will allow the pad to control vehicle 14 in concert with the pad that first energized vehicle 14.

Furthermore, in the example above where the pad 42a has previously selected the vehicle 14, the microcontroller 94 in the central station 64 will cause the vehicle 14 to be released when the pad 42a selects any of the vehicles 12, 16, 17 and 25. Thus, while a single vehicle may be controlled by more than one of pads 42a, 42b, 42c and 42d at a particular instant, each one of pads 42a, 42b, 42c and 42d may only control one of the vehicles 12, 14, 16, 17 and 25 at a single instant. When the vehicle 14 becomes released, it becomes available immediately thereafter to be selected by any one of the pads 42a, 42b, 42c and 42d. The release of the vehicle 14 by the pad 42a and the coupling between the pad 42a and a selected one of the vehicles 12, 14, 16, 17 and 25 are recorded in the random access memory 98 in the microcontroller 94.

It is advantageous to optimize the packets transmitted by the central station 64 so that each transmitted packet contains sufficient information to provide control of the vehicles and accessories in a pleasing manner, but not so much information that troublesome lag times adversely affecting the smooth control of the vehicles are introduced. To prevent such troublesome lag times, the central station 64 uses a variety of methods to prioritize interrogation of the pads 42a, 42b, 42c and 42d, data processing and transmission of the data in packets to the vehicles 12, 14, 16 17 and 25.

In one approach, the microcontroller 94 provides packets of data for transmission to each vehicle in operation in a sequential, round-robin, fashion. In this approach, four packets of commands, each packet being associated with the binary address of each of the vehicles being controlled by individual pads 42a, 42b, 42c and 42d, are transmitted one after another until all four packets are transmitted. Thus the packet of commands addressed to a vehicle controlled by pad 42a may be transmitted first, followed by a packet of commands intended for the vehicle controlled by pad 42b, followed by a packet of commands intended for the vehicle controlled by pad 42c and followed by a packet of commands intended for the vehicle controlled by pad 42d. The sequence of packets would then be repeated. It is evident that this is just one possible sequencing of packets that may be transmitted; other sequences of packet transmission are possible, depending on the program commands stored in the read only memory 96 of the microcontroller 94.

This round-robin transmission method may require, for example, 48 milliseconds to transmit for all four packets. In the case where eight vehicles are being controlled, a transmission cycle would require, for example, 96 milliseconds, or almost 1/10th of a second for all eight packets of command data to be transmitted. Even if the vehicles are traveling at the minimum speed the motors are capable of, the first vehicle may travel perhaps several inches between transmission of packets of commands by the central station 64.

Another embodiment of the invention transmits packets of data only for vehicles that have been selected by users by pressing button 58 the required number of times within the predetermined time. In this manner, only data for vehicles actually under control of a user is transmitted.

In a preferred embodiment, the random access memory 98 maintains a record of the state of each of the pads 42a, 42b, 42c and 42d and the time since the state of the pads changed. One skilled in the art will understand that the actuation of any of the buttons 44, 47, 49 56, 58 60a, 60b, 61a, 61b or 65 of the pad 42a results in a change in the state of the pad 42a. If none of the buttons of the pad 42a is actuated by the operator during the time between interrogations of the pad 42a by the central processor 64, then the state of the pad 42a will not have changed.

Since the state of each of the pads 42a, 42b, 42c and 42d is maintained in the random access memory 98 of the central station 64, the microcontroller 94 may further process the signals received from each of the pads 42a, 42b, 42c and 42d to determine if the state of the pad has changed even if an operator has actuated one of the buttons on the pad. For example, if an operator presses button 44 to command the vehicle energized by that pad to move forward, additional actuations of the button 44 without actuating any other of the buttons of the pad will not result in a change in the state of the pad, and a packet of commands need not be transmitted by the microcontroller 94.

As described previously, the microcontroller 94 of the central station 64 may transmit a continuous stream of packets of commands in a sequential, round-robin, fashion

to the vehicles controlled by the pads 42a, 42b, 42c and 42d. The microcontroller continues to transmit this sequential stream of packets even when none of the buttons on pads 42a, 42b, 42c and 42d have been actuated.

When, however, the microcontroller 94 of the central station 64 determines that  
5 the state of one of the pads 42a, 42b, 42c and 42d has changed, it responds by forming a packet of commands representative of the state of the pad and inserting the newly formed packet of commands into the stream of packets being continuously transmitted, even if the newly formed packet is inserted at a position in the sequence of packets different from the position a packet associated with that particular pad would normally have in the round-robin  
10 sequence of packets. If buttons on two or more of the pads 42a, 42b, 42c and 42d are actuated simultaneously, the microcontroller 94 may form packets of commands representative of the state of those pads and insert the packets in the stream of packets. In this case, the microcontroller 94 may insert the newly formed packets in the order in which they would have been sent in the round-robin sequence, except that the string of newly formed packets  
15 may be inserted in the continuous round-robin sequence out of order. For example, buttons on pads 42a and 42c may be actuated simultaneously and the microcontroller may form a string of packets representative of the state of the pads 42a and 42c such that the packet associated with pad 42a is transmitted before the packet associated with pad 42c. The microcontroller 94 may then insert this string of packets in the stream of packets at the next  
20 available instance, for example, after a packet associated with pad 42c but which is not representative of the change of state of pad 42c has been transmitted. In this manner, the microcontroller 94 employs an intelligent funneling of the data provided by each of the pads 42a, 42b, 42c and 42d during the interrogation process to form packets of commands to be transmitted to each of the vehicles energized by the pads 42a, 42b, 42c and 42d.

25 The vehicles 12, 14, 16 and 17 are battery powered. As a result, the energy in the batteries in the vehicles 12, 14, 16 and 17 tends to become depleted as the batteries provide the energy for operating the vehicles. The batteries in the vehicles 12 and 14 are respectively indicated at 108 and 110 in Figure 3. The batteries 108 and 110 are chargeable by the central station 64 because the central station may receive AC power from a wall

socket. The batteries are charged only for a particular period of time. This particular period of time is preset in the read only memory 96. When each battery is being charged for the particular period of theme, a light 109 in a circuit with the battery becomes illuminated. The charging current to each of the batteries 108 and 110 may be limited by a resistor 111. The  
5 light 109 becomes extinguished when the battery has been charged.

The central station 64 of the present invention, as mentioned previously, includes a microcontroller 94, random access memory 98 and read only memory 96. The central station 64 also includes a smart port 115 that is connected to the microcontroller 94 by lines 505, 510, 520, 530 and 540. The signals transmitted and received by the  
10 microcontroller 94 over the SDATA0, SDATA1, SDATA2 and the SDATA3 lines to the pads 42a, 42b, 42c and 42d may be provided to an accessory connected to the smart port 115 over a cable 114. Using this configuration, all of the signals from the pads 42a, 42b, 42c and 42d may be rerouted through the smart port 115 before being processed by the microcontroller 94. One principal advantage of this configuration of the central station 64 is that various  
15 accessories, including additional central stations, may be connected to the smart port 115 and alter signals received from the pads 42a, 42b, 42c and 42d and process the signals in a different manner than they would normally be processed by the microcontroller 94. Accessories that may be attached to the smart port 115 may include additional microcontrollers 94a that may, for example, have information stored in a separate read only  
20 memory and random access memory that allow the second processor to remap the functions of the buttons 44, 47, 49, 56, 58, 60a, 60b, 61a, 61b and 65 on the pads 42a, 42b, 42c and 42d. For example, a signal from pad 42a representative of the closure of switch 46 could be routed through the smart port 115 and over the cable 114 to be processed by the accessory microcontroller 94a. All signals rerouted to accessories connected to the smart port 115 are  
25 returned after processing by the accessory over the cable 114 to the microcontroller 94. The microcontroller 94 then forms a packet 200 comprising data bits commanding the appropriate receiver to take action. For example, a signal from a pad may be interpreted by microcontroller 94a as a command to a toy hockey player to raise its arm, rather than the usual meaning for the command, such as to command a toy vehicle to move forward. The  
30 microcontroller 94a would then provide a signal over cable 114 to the microcontroller 94. In

this manner, each of the keys of the pads 42a, 42b, 42c and 42d may be reprogrammed to have different functions. This approach is particularly advantageous in that it allows for increased flexibility and future expansion of the capabilities of the central station. Thus, the central station could control a wide variety of games and activities without the need for costly changes in hardware or reprogramming the information stored in the read only memory 96.

A particularly illustrative example of the advantages of the smart port 115 is where an additional central station 64 is connected to the first central station 64. Each central station 64 may have the capabilities of servicing only a limited number of pads. For example, each central station 64 may have the capabilities of servicing only the four (4) pads 42a, 42b, 42c and 42d. It may sometimes happen that the users of the system may wish to be able to service more than four (4) pads. Under such circumstances, the microcontroller 94 in the central station 64 and a microcontroller, generally indicated at 94a, in the second central station corresponding to the central station 64 may be connected by cable 114 to the smart port 115.

One end of the cable 114 may be constructed so as to connect to a ground 117 in the smart port 115. This ground operates upon the central station to which it is connected so that such central station is a slave to, or subservient to, the other central station. For example, the ground 117 in the smart port 115 may be connected to the microcomputer 94a so that the central station including the microcontroller 94a is a slave to the central station 64. When this occurs, the microcontroller 94 in the central station 64 serves as the master for processing the information relating to the four (4) pads and the four (4) vehicles in its system and the four (4) pads and the four (4) vehicles in the other system. The expanded system including the microcontrollers 94 and 94a may be adapted so that the address and data signals generated in the microcontroller 94a may be transmitted by the antenna 68 in the central station 64 when the central station 64 serves as the master station. The operation of the central station 64a may be clocked by the signals extending through a line 118 from the central station 64 to the adaptor 115 and through a corresponding line from the other central station to the adaptor.



Referring now to Figure 10, the interface of the smart port 115 will be described in more detail. As described above, an accessory generally indicated at numeral 500 may be connected to the smart port 115 of the central station 64. The accessory 500 may include a microcontroller 502. The microcontroller 502 of the accessory 500 may also include  
5 a random access memory 544 and a read only memory 546. As with the memories in the microcontroller 94 in the central station 64, the random access memory 544 stores volatile or impermanent information and the read only memory 96 stores permanent information.

As shown in Figure 3, the microcontroller 94 of the central station is connected to the smart port 115 using five signal lines, lines SK line 505, SO line 510, SI line 520,  
10 ACCIO line 530 and ACCIO2 line 540 and a ground line 117. The ground line 117 provides a common electrical reference for the microcontroller 94 of the central station 64 and the microcontroller 502 of the accessory 500. These lines are similarly shown in Figure 10, but the lines are shown directly connected to the accessory 500, with the smart port 115 indicated in dashed form. It will be apparent that the smart port 115 may be only a connector mounted  
15 on the central station 64 allowing the connection of the cable 114 (Figure 3). The cable 114 has one end connected to the accessory 500, either directly or through an appropriate connector, and the other end terminating in a connector compatible with a corresponding connector forming the smart port 115 of the central station 64.

In a preferred embodiment, each of the microcontrollers 94 and 502 include  
20 a serial interface comprising inputs and outputs for connecting the lines 505, 510, 520, 530 and 540 and various logical elements, such as shift register 97 in the microcontroller 94 of the central station 64 and shift register 542 in the microcontroller 542 of the accessory 500. These serial interfaces enable the transfer of data between the microcontroller 94 of the central station 64 and the microcontroller 502 of the accessory 500. As used in the present  
25 invention, the serial interface of the microcontroller 94 of the central station 64 is configured as a master and provides a shift clock signal over the SK line 505 to the SK input of the microcontroller 502 in the accessory 500. Thus, the transfer of data over the serial interface to the microcontroller 502 is controlled by the microcontroller 94 of the central station.

In the present invention, as depicted in Figure 10, the SO output of the smart port 115 is connected to the SI input of the microcontroller 502 by line 520. Similarly, the SO output from the microcontroller 502 of the accessory 500 is connected to the SI input of the microcontroller 94 of the central station 64 by line 510. In this manner, data may be shifted out of the shift register 97 of the microcontroller 94 of the central station 64 over the SO line 520 into the SI input of the microcontroller 502 into the shift register 542 of the accessory 500. Similarly, since the data transfer over the serial interface is bidirectional, as will be more fully described below, data may be shifted out of the shift register 542 of the microcontroller 502 over the SI line 510 into the SI input of the microcontroller 94 and into the shift register 97 of the central station 64. Two additional lines, lines ACCIO line 530 and ACCIO2 line 540 carry handshaking signals output by the microcontrollers 502 and 94 respectively, the ACCIO2 line 540 carrying signals from the microcontroller 94 to the microcontroller 502, and the ACCIO line 530 carrying signals from the microcontroller 502 to the microcontroller 94.

Referring now to Figures 10 and 11, a typical timing sequence of data flow across the serial interface of the smart port 115 will be described. The microcontroller 94 in the central station 64 continuously provides the smart port 115 with signals representing the current state of the central station 64. Such signals may be, for example, signals indicating the status of switch closures in the pads 42a, 42b, 42c, and 42d, signals representative of the values of various timing function carried out by the microcontroller 94 of the central station 64, such as signals indicating how much time remains before a vehicle will be provided with a signal to enter the powered, but inactive state because there has been no thumb pad activity, or signals indicating that a vehicle will be released from a particular one of the pads 42a, 42b, 42c and 42d because no switch on the particular pad had been activated for a prolonged period of time.

The microcontroller 94 monitors the state of the signal on line ACCIO 530. When the signal on line 530 is high, which may be the normal state of the signal on the line 530, the central station 64 assumes that either no accessory is connected to the smart port 115, or that the accessory 500 is a "dumb" accessory which is incapable of modifying the signals

provided by the microcontroller 64 through the smart port 115. Examples of such "dumb" accessories may include devices that react to the signals provided by the central station, but do not process the signals, such as a sound device that produces a sound in response to a signal from the central station. When a "dumb" accessory, or no accessory at all, is connected  
5 to the smart port 115, the microcontroller 94 of the central station continues to process data, for example, data received from the pads 42a, 42b, 42c and 42d, in a normal mode, acting upon the data stored in the random access memory 98 and causing signals to be sent to the receivers of the various vehicles through the radio frequency transmitter 104 (Figure 3).

The accessory may also be a so called "smart" accessory possessing the ability  
10 to process and modify the signals received from the smart port 115, and then return the modified signals to the microcontroller 94 of the central station 64 through the smart port 115. When a "smart" accessory is connected to the smart port 115, the microcontroller 94 of the central station enters a second operating mode. In this operating mode, the microcontroller is configured to receive modified data from the microcontroller 502 of the accessory 500 and  
15 store that modified data in its random access memory 98. Depending on the programmable capabilities of the microcontroller 502 of the accessory 500, all, or a selected portion, of the data stored in the random access memory 98 of the microcontroller 94 may be modified by the microcontroller 502 of the accessory 500. Additionally, when a "smart" accessory is connected to the smart port 115, the microcontroller 94 of the central station may not process  
20 any of the signals received from the pads 42a, 42b, 42c and 42d, but instead provide the signals unchanged to the smart port 115 for transmission to the microcontroller 502 of the accessory 500.

The microcontroller 94 of the central station 64 detects when a smart accessory 500 is attached to the smart port 115 because the signal on line ACCIO 530 will be  
25 periodically driven low by the microcontroller 502 of the accessory 500, indicating that the accessory is ready to receive data from the microcontroller 94 of the central station 64. Once the signal on line 520 goes low, the microcontroller 94 will begin sending data to the microcontroller 502 through the smart port 115 over the SO line 520 when the microcontroller determines it has data to send to the accessory. It will be apparent that since the

microcontroller 94 of the central station 64 is the master, as described above, it is the microcontroller 94 that controls the flow of data over the serial interface to the accessory 500. The microcontroller 502 of the accessory 500 may only be enabled to indicate that it is ready to receive data from the microcontroller 94 by driving the line ACCIO line low. Thus, if the  
5 microcontroller 94 has no data to send to the microcontroller 502 because, for example, no buttons on the pads 42a, 42b, 42c and 42d have been pushed, the microcontroller 502 simply waits for data to be sent.

As indicated by the timing diagram line 550 of Figure 12, the transition of the signal level on ACCIO line 530 from high to low causes the shift register 97 of the  
10 microcontroller 94 of the central station 64 to begin shifting data bits (assuming there is data to send) out of the shift register 97 onto the SO line 520. Because the SO line 520 is connected to the shift input of the shift register 542 of the microcontroller 502 of the accessory 500, each bit shifted from the microcontroller 94 is shifted into the shift register 542 of the microcontroller 502. Because the shift registers 97 and 542 are serial input/output  
15 registers, shifting a bit of data out of the shift register 97 into the shift register 542 over the SO line 520 causes a bit to be shifted out of the shift register 542 of the microcontroller 502 onto line 530 and into the shift input of the shift register 97 of the microcontroller 94 of the central station 64.

The microcontroller 94 generates a shift clock signal, indicated as line 552 in  
20 Figure 11. Bits are shifted out of, and thus into, the shift registers 97 and 542 in response to the transition of the shift clock signal from high to low on the SK line 505. The microcontroller 94 may be programmed to maintain a count of the number of shift clock signals provided since the first shift clock signal. When the count equals, for example, eight, indicating that eight shift clock signals have been provided to shift a total of eight bits out of  
25 the shift registers 97 and 542, the microcontroller 94 may pulse the signal on the ACCIO2 line 540 low for a brief period of time, indicating to the microcontroller 502 of the accessory 500 that the microcontroller 94 has completed sending eight bits of data over the SO line 520. When the signal on line ACCIO2 goes low, the microcontroller 502 resets the signal on the ACCIO line 540 to high, indicating to the microcontroller 94 of the central station that the

microcontroller 502 is processing the data sent to it over the SO line 520 by the microcontroller 94 and is not ready at that instant to receive any additional data.

When the microcontroller 502 is again ready to receive data from the microcontroller 94, such as, for example, when microcontroller 502 has completed processing the data received from the microcontroller 94 during the previous shift cycle, the microcontroller 502 drives the signal on line ACCIO 530 low, indicating its state of readiness to the microcontroller 94 of the central station 64. At this time, if the microcontroller 94 of the central station has data to send to the microcontroller 502 of the accessory 500, the shift cycle is repeated. One advantage of this interface is that data flows to and from the microcontroller 94 of the central station 64 and to and from the microcontroller 502 of the accessory 500 simultaneously. This feature is particularly important since the routing of the signals from the central station 64 to the accessory 500, and subsequent processing of those signals by the microcontroller 502 and retransmission back to the central station 64 requires additional time, and thus may impart unacceptable delay in the response of the vehicles 12, 14, 16, 17 and 25 to actuations of buttons on the pads 42a, 42b, 42c and 42d.

The vehicle 12 is shown in additional detail in Figure 4. Substantially identical arrangements may be provided for the vehicles 14, 16, 17 and 25. The vehicle 12 includes the antenna 69 for receiving from the central station 64 signals with the address of the vehicle and also includes a receiver 121 for processing the received signals. The vehicle 12 also includes the motors 28, 30, 32 and 33. Each of the motors 28, 30, 32, and 33 receives signals from an individual one of the transistor drivers 120 connected to a microcontroller generally indicated at 122.

The microcontroller 122 includes a read only memory (ROM) 124 and a random access memory (RAM) 126. As with the memories in the pad 42a and the central station 64, the read only memory 124 may store permanent information and the random access memory 126 may store volatile (or impermanent) information. For example, the read only memory 124 may store information indicating the sequence of the successive bits of information in each packet for controlling the operation of the motors 28, 30, 32 and 33 in

the vehicle 12. The random access memory 126 stores information indicating whether there is a binary 1 or a binary 0 at each successive bit in the packet.

5 The vehicle 12 includes a plurality of switches 128, 130 and 132. These switches are generally pre-set at the factory to indicate a particular Arabian number such as the number "5". However, the number can be modified by the user to indicate a different number if two central stations are connected together as discussed above and if both stations have vehicles identified by the numeral "5". The number can be modified by the user by changing the pattern of closure of the switches 128, 130, and 132. The pattern of closure of the switches 128, 130 and 132 controls the selection of an individual one of the vehicles such as the vehicles 12, 14, 16, 17 and 25.

15 The pattern of closure of the switches 128, 130, and 132 in one of the vehicles can be changed when there is only a single central station. For example, the pattern of closure of the switches 128, 130 and 132 can be changed when there is only a single central station with a vehicle identified by the numeral "5" and when another user brings to the central station, from such other user's system, another vehicle identified by the numeral "5".

20 The vehicle 12 also includes a light such as a light emitting diode 134. This diode is illuminated when the vehicle 12 is selected by one of the pads 42a, 42b, 42c and 42d. In this way, the other users can see that the vehicle 12 has been selected by one of the pads 42a, 42b, 42c and 42d in case one of the users (other than the one who selected the vehicle 12) wishes to select such vehicle. It will be appreciated that each of the vehicles 12, 14, 16, 17 and 25 may be generally different from the others so each vehicle may be able to perform functions different from the other vehicles. This is another way for each user to identify the individual one of the vehicles that the user has selected.

25 When the RF receiver 121 receives a stream of packets 200 that have been transmitted by the radio frequency transmitter 104, the microcontroller 124 must decode the received packets to determine the values of each of the bits included in the packet 200. The microcontroller 122 begins the decoding process by determining the duration between pairs

of start bits 202, 204 that have been received. If the duration between pairs of start bits 202, 204 is not within a range of values stored in the read only memory 124, or if the microcontroller 122 detects only one start bit 204, the microcontroller 122 may determine that the packet 200 has been corrupted or is otherwise undecodable. The microcontroller continues  
5 to analyze the pairs of start bits 202, 204 until the duration between successive pairs of the start bits 202, 204 is within the range of values stored in the read only memory 124.

The microcontroller determines a bit duration for each of the bits contained within the packet 200 by dividing the interval of time measured between two successive pairs of start bits by sixteen, the number of data bits in a valid packet 200. In this manner, the  
10 microcontroller 122 determines the bit duration during processing, allowing for variation in bit duration that may be caused by variations in the transmitted stream of packets, and allowing the microcontroller 122 to synchronize the analysis of the values of the bits contained within the packet 200. One advantage of determining the bit duration on the fly in this manner by analyzing the duration between pairs of start bits 202, 204 is that the  
15 microcontroller may recover from a loss of synchronization caused by corrupted packets 200 having fewer or more than sixteen bits within one packet cycle. This rapid recovery of synchronization is advantageous in that it promotes efficient use of the radio frequency bandwidth by not requiring an excessive number of packet cycles for recovery, thus preventing annoying lags in the response of the vehicle to switch closures on the pads 42a,  
20 42b, 42c and 42d.

The capability of the microcontroller 122 to adapt to variations in the timing of the bits in the packets 200 provides the potential for future upgrades in the rate of transmission of the signals from the central station 64 while maintaining the usefulness of the microcontroller 122 in the vehicles. For example, future developments in the central station  
25 64 may include increasing the transmission rate of the packets 200, resulting in decreased packet and bit durations. The microcontroller 122 in the vehicles 12, 14, 16, 17 and 25 may adapt to the decreased packet and bit durations because the microcontroller 122 synchronizes and decodes the packets 200 on the fly, thus ensuring that older vehicles continue to work with the upgraded central station 64.

When the received packet 200 has been decoded by the microcontroller 122, the microcontroller 122 enables a signal to the motors 28, 30, 32 and 33 according to the values of the bits in the packet 200. The microcontroller may continue to enable the signal until the signal has been enabled for a period of time equal to a value stored in the read only memory 124. For example, each motor enabling signal provided by the microcontroller 122 may be continued for 0.25 seconds, unless the microcontroller receives a command from a later received packet 200 to discontinue the motor enabling signal. One advantage of such a continuation of the enabling signal is that it promotes smooth movement of the vehicle where radio frequency noise in the operating environment results in the reception of spurious or corrupted packets 200 by the RF receiver 69. Reception of such spurious or corrupted packets 200 without the continuation of the enabling signal may result in undesired discontinuous or jerky motion of the vehicle, or a degradation of the fine control of the vehicle necessary to allow the vehicle to maneuver in close quarters. Additionally, the continuation of the enabling signal allows the microcontroller 122 to overcome periods of lower than normal operating voltage caused when one of the motors 28, 30, 32 and 33 start up and the battery charge is low. The motors 28, 30, 32 and 33 require, for example, 80 milliamperes of current to operate when they are operating at full speed. These same motors, however, may require as much as 200 milliamperes to start up when they have not been operating. Thus current requirement may cause as much as a 0.5 volt voltage drop in the operating voltage of the vehicle for a period of up to 0.1 seconds. When the battery charge is low, which may occur after prolonged use of the vehicle or when the vehicle has been idle, but the battery has not been recharged for an extended period of time, this voltage drop may be sufficient to cause the operating voltage available to power the vehicle to fall below the minimum voltage required to power the RF receiver thus momentarily preventing the reception and decoding of packets 200 of data. Continuing the enabling signal provided to the motors 28, 30, 32 and 33 by the microcontroller 122 overcomes this problem by allowing the vehicle to continue to operate until the operating voltage increases as the motor comes up to speed and the RF receiver 121 recovers.

As previously indicated, the user of one of the pads such as the pad 42a selects the vehicle 12 by successively depressing the button 58 a particular number of times within



a particular time period. This causes the central station 64 to produce an address identifying the vehicle 12. When this occurs, the central station 64 stores information in its random access memory 98 that the pad 42a has selected the vehicle 12. Because of this, the user of the pad 42a does not thereafter have to depress the button 58 during the time that the pad 42a is directing commands through the station 64 to the vehicle 12. As long as the buttons on the pad 42a are depressed within a particular period of time to command the vehicle 12 to perform individual functions, the microcontroller 94 in the central station 64 will direct the address of the vehicle 12 to be retrieved from the read only memory 96 and to be included in the packet of the signals transmitted by the central station to the vehicle 12.

10                   The read only memory 96 in the microcontroller 94 at the central station 64 stores information indicating a particular period of time in which the vehicle 12 has to be addressed by the pad 42a in order for the selective coupling between the pad and the vehicle to be maintained. The random access memory 98 in the microcontroller 94 stores the period of time from the last time that the pad 42a has issued a command through the central station  
15                   64 to the vehicle 12. When the period of time in the random access memory 98 equals the period of time in the read only memory 96, the microcontroller 94 will no longer direct commands from the pad 42a to the vehicle 12 unless the user of the pad 42a again depresses the button 58 the correct number of times within the particular period of time to select the vehicle 12.

20                   The vehicle 12 also stores in the read only memory 124 indications of the particular period of time in which the vehicle 12 has to be addressed by the pad 42a in order for the selective coupling between the vehicle and the pad to be maintained. This period of time is the same as the period of time specified in the pervious paragraph. The random access memory 126 in the microcontroller 122 stores the period of time from the last time that  
25                   the pad 42a has issued a command to the vehicle 12.

As previously indicated, the button 58 in the pad 42a does not have to be actuated or depressed to issue the command after the pad 42a has initially issued the command by the appropriate number of depressions of the button. When the period of time stored in

the random access memory 126 of the microcontroller 122 in the vehicle equals the period of time in the read only memory 124, the microcontroller 122 issues a command to extinguish the light emitting diode 134. This indicates to the different users of the system, including the user previously controlling the operation of the vehicle 12 that the vehicle is available to be selected by one of the users including the user previously directing the operation of the vehicle.

When one of the vehicles such as the vehicle 12 is being moved in the forward direction, the random access memory 126 records the period of time during which such forward movement of the vehicle 12 is continuously occurring. This period of time is continuously compared in the microcontroller 122 with a fixed period of time recorded in the read only memory 124. When the period of time recorded in the random access memory 126 becomes equal to the fixed period of time recorded in the read only memory 124, the microcontroller 122 provides a signal for increasing the speed of the movement of the vehicle 12 in the forward direction. If the vehicle continues to be commanded to be moved forward, the period of time since the speed was increased may again be recorded in the random access memory 126 and is again continuously compared in the microcontroller 122 with a fixed period of time recorded in the read only memory 124. When the period of time recorded in the random access memory 126 becomes equal to the fixed period of time recorded in the read only memory 124, the microcontroller 122 provides a signal to further increase the speed of the movement of the vehicle 12. The microcontroller may continue the cycle of monitoring the time of movement and providing signals to increase the speed of movement of the vehicle up to a predetermined number of cycles, the number of which may be stored in the read only memory 124. Similar arrangements are provided for each of the vehicles 14, 16 and 17. This increased speed may illustratively be twice, three times or more than that of the original speed.

As described above, each of the vehicles 12, 14, 16, 17 and 25 has a plurality of motors 28, 30, 32 and 33. When one of these motors is energized by the microcontroller 122 as described in the previous paragraph, the microcontroller 122 records a value representative of the speed of the motor in the random access memory 126. If the

microcontroller 122 receives a packet 200 of data from the central station 64 commanding the energization of a second or third one of the motors 28, 30, 32 and 33, the microcontroller 122 provides a signal to the transistor driver 120 associated with that second or third one of the motors 28, 30, 32 and 33 to start and run that motor at the speed recorded in the random  
5 access memory 126 representative of the current operating speed of the first of the motors 28, 30, 32 and 33 to be energized. If both motors continue to be energized for a period of time exceeding the period of time stored in the read only memory 124 as described previously, the transistor drivers 120 associated with all of the motors energized at that instant receive signals from the microcontroller 122 to increase the speed of the motors to the next level.

10 The microcontroller 122 continuously monitors the RF receiver 121 for RF packets 200 transmitted by the central station 64. While the central station is turned on, the RF transmitter 104 continuously transmits packets 200 of information regarding the status of the switch closures of the pads 42a, 42b, 42c and 42d, as well as any special commands that are required. The RF receiver of each of the vehicles 12, 14, 16, 17 and 25 is responsive to  
15 the presence of RF packets 200 that carry the unique combination of identifier bits 206, 208, 210 and 212 assigned to a particular vehicle as described above. If the RF receiver 69 of a particular one of the vehicles does not receive a command for a predetermined period of time, the value of which is stored in the read only memory 124, the microcontroller 124 infers that the vehicle is not being used by an operator, and places the vehicle in a powered, but inactive  
20 state.

When a vehicle is in the powered, but inactive state and the microcontroller 122 determines that a packet 200 addressed to the particular vehicle has been received, it stores the values of bits of the packet 200 in the random access memory 126, and continues to monitor the output of the RF receiver 121. If the microcontroller 122 detects another packet  
25 200 addressed to it, it compares the newly received packet 200 with the stored packet. If the received and stored packets are identical, and the received packet has been detected within a predetermined period of time stored within the read only memory 124, the microcontroller 122 recognizes that its vehicle has been selected by the operator of one of the pads 42a, 42b, 42c and 42d. The microcontroller 122 then enters a "powered and selected" state and causes

the light emitting diode 134 to change from a blinking light to a constant light. The requirement that the microcontroller 122 detect two identical packets 200 addressed to it is advantageous in eliminating spurious "glitching" of the RF system of the vehicle. This is necessary because of the amount of RF "noise" present under even routine operating  
5 conditions, which can adversely impact the precise control of the vehicles necessary.

As will be discussed in more detail below, the microcontroller 122 also continuously monitors the received packets to determine if the packets are valid. For example, the microcontroller 122 may determine whether the packets comprise the correct number of non-conflicting data bits, with each bit having an allowed value. Once the  
10 microcontroller 122 has entered the powered and selected state, each valid packet of information received by RF receiver 121 and addressed to the vehicle is considered by the microcontroller 122 to be a valid command, and is acted on accordingly by the microcontroller 122 to control the motors 28, 30, 32 and 33 of the vehicle.

The identities of the last two vehicles selected by a pad are stored in a  
15 flashback queue stored in the random access memory 82 (Figure 2). If the pad is automatically deselected as described above because no buttons on the pad have been pushed during the predetermined interval stored in the read only memory 80, the first actuation of any button on the deselected pad causes the central station 64 to attempt to automatically log onto the last vehicle selected by that pad. When the selected vehicle is already selected by another  
20 one of the pads 42a, 42b, 42c and 42d, the automatic log onto the vehicle will succeed only if switch 65 on the pad currently controlling the vehicle has been set in the second position to enable the second mode allowing control of the vehicle to be shared by other pads.

When the first automatic log on attempt is unsuccessful because the last vehicle controlled by the pad is already selected by another pad that is not set in the second mode,  
25 the central station attempts to log on to the second to last vehicle controlled by the pad. This second automatic log on attempt is also sensitive to the state of the mode setting of another pad already controlling the vehicle. If this second automatic log on attempt is unsuccessful, then the central station attempts to log on to each of the vehicles 12, 14, 16, 17 and 25 in

turn, beginning with the vehicle identified by the Arabian number "1" until a log on attempt is successful.

In order to optimize the transmission of packets, and also to conserve battery energy in vehicles that are in the powered, but inactive state, the microcontroller 94 of the central station may only execute the automatic log on attempt when a command signal is provided by the pad 42a, 42b, 42c and 42d. In other words, the automatic log on may only be attempted when one of the buttons 44, 47, 49, 56, 58, 60a, 60b, 61a and 61b are actuated to command the movement of a vehicle. Actuation of button 65, however, since button 65 does not control any of the motors 28, 30, 32 and 33 of the vehicles, may not initiate the automatic log on attempt.

An additional feature of the system of the present invention that utilizes the flashback queue may be activated when an operator presses button 47 on a pad 42a, 42b, 42c and 42d. Actuation of button 47 closes switch 53 and causes the pad to deselect the vehicle currently controlled by the pad, and attempt to log on to the last vehicle controlled by the pad before the current vehicle was selected by pressing button 58 the required number of times. This feature may also be sensitive to the state of the mode select switch 65 on a pad controlling the vehicle on which the automatic log on is attempted. If the vehicle is currently controlled by another of the pads 42a, 42b, 42c and 42d, then the automatic log on attempt after pressing button 47 will be successful only if the switch 65 on the other pad is set to enable the second, shared control, mode. As before, if the automatic log on attempt caused by pressing button 47 is unsuccessful, then an attempt will be made to log on to the second to last vehicle controlled by the pad. One difference between the automatic log on attempts made when the pad has been deselected and the attempts enabled by pressing button 47 is that the latter may make no further attempts to log on to any other vehicles if the second automatic log on attempt is unsuccessful.

One advantage of the arrangement of bits in the packet 200 is that the bits 214, 216, 218 and 220 are representative of switch actuations of the pads 42a, 42b, 42c and 42d that may be mutually exclusive. The bits 214, 216, 218 and 220 may be given values by the

microcontroller 94 of the central station 64 that would normally be interpreted by the microcontroller 122 of the vehicles 12, 14, 16, 17 and 25 as illegal commands. For example, the case where the value of bits 214 and 216 are both binary 1, representing switch actuations on one of the pads 42a, 42b, 42c and 42d to command a vehicle to simultaneously move in  
5 a forward and a backward direction would be interpreted by the microcontroller 122 as an illegal command, and would be ignored by the microcontroller 122. This may occur, for example, where the vehicle identified by bits 206, 208, 210 and 212 is being controlled by two or more pads, as described previously. In such a case, the operator of one of the pads may push button 44, for example, to actuate switch 46 to command the vehicle to move  
10 forward (Figure 2). At the same instant, the operator of the other pad controlling the vehicle may push button 44 to actuate switch 48 to command the vehicle to move backwards. The microcontroller 94 would form a packet 200 in response to these commands directed to the selected vehicle having a value of binary 1 in each of the bits 214 and 216. As stated, the microcontroller 122 of the vehicle would interpret such a packet 200 as an illegal packet, and  
15 would not provide signals to the transistor drivers 120 of the motors 28, 30, 32 and 33 (Figure 4) in accordance with the values of the bits 214 and 216 of the packet 200. In one embodiment of the invention, such illegal commands could instead be used to signal the microcontroller 122 that the bits following the illegal command bits contain instructions to carry out a special command.

20 A particular sequence of otherwise illegal combinations of values of the bits 214, 216, 218 and 220 associated with a special command may be stored in the read only memory 124. It will be understood that more than one illegal sequence of bits 214, 216, 218 and 220 is possible; thus the read only memory 126 may contain as many sequences representing special commands as there are illegal sequences of bits 214, 216, 218 and 220.  
25 When the RF receiver 121 receives a transmitted packet 200, the sequence of bits comprising the packet 200 is stored in the random access memory 126. The microcontroller 122 compares the sequence of bits 214, 216, 218 and 220 stored in the random access memory to the sequences stored in the read only memory 126, and if there is a match, the microcontroller 122 executes the special command associated with the sequence of bits 214,  
30 216, 218 and 220. Such special commands may include, by way of illustration and not

limitation, commands to power down the vehicle, reset the microcontroller 122 or to immediately cause the microcontroller 122 to enter the "powered, but inactive" state.

5 If the microcontroller 122 determines that none of the sequences of bits 214, 216, 218 and 220 stored in the read only memory 124 matches the sequence of bits stored in the random access memory 126, the microcontroller determines that the sequence of bits 214, 216, 218 and 220 stored in the random access memory 126 is an illegal sequence of bits not associated with any special command. The microcontroller 122 may then ignore the entire packet 200 or the microcontroller 122 may interpret and execute commands associated only with bits whose values represent legal commands.

10 Accessories connected to the smart port 115 of the central station 64 may also provide signals to the microcontroller 94 of the central station 64 to be transmitted to the vehicles 12, 14, 16, 17 and 25. While bit 236 of the packet 200 is normally used by the microcontroller in an accessory to instruct the microcontroller 94 of the central station 64 to perform some activity, such as sounding a horn, bit 236 may also be used to indicate that the  
15 values of the bits in the packet 200 should be interpreted as special commands, rather than their usual meanings. For example, where the accessory connected to the smart port 115 instructs the microcontroller 94 of the central station 64 to transmit a special command, the microcontroller of the accessory may set the value of bit 236 to a binary 1. When the packet containing this bit is received by the desired vehicle, the packet 200 of bits is stored in the  
20 random access memory 126 and the value of bit 236 instructs the microcontroller 122 of the vehicle to compare the values of the data bits 214, 216, 218, 220, 222, 224, 226 228, 230, 232 and 234 to sequences of bits stored in the read only memory 124 associated with special commands generated by the accessory connected to the smart port 115 of the central station 64. If the microcontroller 122 then executes the special commands to control the motors 28,  
25 30, 32 and 34, or other auxiliary equipment or devices that may be in use that is associated with the vehicle or device identified by the bits 206, 208, 210 and 212 of the packet 200.

Since the vehicle 12 is battery powered, various systems and processes are incorporated within the programming of the microcontroller 122 and the read only memory

124 to optimize the power utilization of the vehicle. For example, when the microcontroller 122 has not detected any packets addressed to the vehicle for the predetermined period of time stored in the read only memory 124, the microcontroller automatically places the vehicle in the powered, but inactive state.

5           As described above, the central station 64 transmits a continuous stream of packets 200 when the central station is powered. If the central station is turned off, the microcontroller 94 of the central station 64 may, as it powers down the central station 64, send a special command to the vehicles to enter a powered down state. Alternatively, the microcontroller 122 in the vehicle may cause the vehicle to automatically enter the powered down state if no  
10 RF packets 200 transmitted by the central station 64 are received for a predetermined period of time stored within the read only memory 124. As mentioned previously, the normal operating environment may contain a high level of random RF "noise" that may be detected by the microcontroller 122. Accordingly, the microcontroller may be programmed with the capability of filtering the signals received by the RF receiver 121 to eliminate spurious  
15 packets. The microcontroller 122 may determine that RF packets are being transmitted by the central station 64 only if a percentage of the packets received during a predetermined time are determined to be valid packets 200. For example, fifty percent of the packets received during one second may be determined by the microcontroller 122 to be valid or the microcontroller will begin powering down the vehicle. Such a determination by the microcontroller 122 may,  
20 for example, include determining whether the received packet 200 contains the correct number of data bits.

          If the microcontroller 122 determines that the vehicle should be powered down, it may provide a visual signal to the operators of the system by causing the light emitting diode 134 to blink at a rate obviously different from the blink rate identifying the powered,  
25 but inactive state. For example, the light emitting diode may blink at twice the rate for one minute. At the end of the predetermined time, if the microcontroller 122 has still not detected any valid RF packets, the microcontroller causes the vehicle to be completely powered down, and removes the power from the light emitting diode 134, causing it to go dark.



Further energy optimization may be achieved by utilizing pulse width modulation techniques to energize the motors 28, 30, 32 and 33. For example, the speed of the motors 28, 30, 32 and 33 may be controlled at three different levels by applying power to the motor for one third of a power cycle to achieve a first speed, for two thirds of power cycle to achieve a second speed, and continuously throughout the power cycle to achieve a third, maximum speed. Thus, a power cycle may typically have three time slices.

The microcontroller 122 may select which of the three time slices to apply power to the selected one of the motors 28, 30, 32 and 33 to achieve the desired speed. For example, the first speed may be achieved by applying power to the selected motor during any one of the three time slices, and the second speed may be achieved by applying power during any two of the three time slices, while the third speed is achieved by applying power during all three of the time slices.

In a preferred embodiment, the microcontroller 122 applies power to the selected one of the motors 28, 30, 32 and 33 in the first time slice available after the packet 200 of data containing the command to energize the motor is received and decoded. Selecting the first available time slice in this manner to provide power to the selected motor provides improved response of the vehicle to switch actuations on the pads 42a, 42b, 42c and 42d to enhance control and maneuverability of the vehicles 12, 14, 16, 17 and 25 by the operator.

Referring now to FIG. 7, the interface between the microcontroller 94 of the central station 64 and the pads 42a, 42b, 42c and 42d is shown in more detail. As described previously, all of the data and control signals passing between the microcontroller 94 of the central station 64 and the pads 42a, 42b, 42c and 42d is conveyed over three lines.

In a preferred embodiment, the microcontroller 94 has nine input/output (I/O) lines 84, 86a, 86b, 86c, 86d, 88a, 88b, 88c and 88d devoted to determining the status of the switch closures of the switches in switch matrix 43 of the pads 42a, 42b, 42c and 42d and for modifying the status of the light emitting diodes 93 of the pads (Figure 2). Line SEL% 84 is a common line connected to a corresponding input/output port on each of the pads 42a, 42b, 42c and 42d. There are four SCLK I/O lines 86a, 86b, 86c and 86d connected to

corresponding I/O ports on the pads 42a, 42b, 42c and 42d. Specifically, SCLK line 86a is connected to I/O port SCLK0 on pad 42a, SCLK line 86b is connected to I/O port SCLK1 on pad 42b, SCLK line 86c is connected to I/O port SCLK2 on pad 42c and SCLK line 86d is connected to I/O port SCLK3 on pad 42d. Similarly, SDATA line 88a is connected to I/O port SDATA0 on pad 42a, SDATA line 88b is connected to I/O port SDATA1 on pad 42b, SDATA line 88c is connected to I/O port SDATA2 on pad 42c and SDATA line 88d is connected to I/O port SDATA3.

This architecture allows the microcontroller 122 to read the status of the switch closures of switch matrix 43 from all four pads 42a, 42b, 42c and 42d simultaneously in parallel fashion, or alternatively, to read the status of an individual one of the pads 42a, 42b, 42c and 42d. As will be described in more detail with reference to Figures 8 and 9, the microcontroller 94 may read the status of the pads 42a, 42b, 42c and 42d by sending appropriate signals over the SEL% line 84 and the SCLK lines 86a, 86b, 86c and 86d. When the microcontroller 92 sends the appropriate signal over SEL% line 84, and sends the identical appropriate signal over the SCLK lines 86a, 86b, 86c and 86d, the status of the switch closures of each of the pads 42a, 42b, 42c and 42d is read simultaneously by the microcontroller 94 over the SDATA lines 88a, 88b, 88c and 88d. Alternatively, the microcontroller 94 may provide the appropriate signal over a selected one or ones of the SCLK lines 86a, 86b, 86c and 86d. Thus, the microcontroller 94 reads the status of the switch closures only of the pads 42a, 42b, 42c and 42d receiving the signal over the selected one or ones of the SCLK lines 86a, 86b, 86c and 86d. In like manner, the microcontroller may provide the appropriate signals over the SEL% line 84 and the SCLK lines 86a, 86b, 86c and 86d to enable the pads 42a, 42b, 42c and 42d to receive signals to update the status of the light emitting diodes 93 (Figure 2) over the SDATA lines 88a, 88b, 88c and 88d either simultaneously or selectively.

One advantage to using a common SEL% line connecting all of the pads 42a, 42b, 42c and 42d is that it eliminates three input/output lines, allowing the use of a less expensive microcontroller 94. A further advantage is that the pads 42a, 42b, 42c and 42d are not connected in series. Thus, selected ones of the pads 42a, 42b, 42c and 42d may be either

connected or disconnected from the central station without affecting the operation of microcontroller 94 or the central station 64. As mentioned previously, the microcontroller 94 is capable of detecting whether a pad is connected to the central station 64, and immediately recognize when a pad is connected or disconnected. In the event a pad is disconnected, the  
5 microcontroller 94 may discontinue sending signals over the SCLK lines 86a, 86b, 86c and 86d and the SDATA lines 88a, 88b, 88c and 88d associated with the disconnected pad to read the status of the pad or to update the status of the light emitting diodes 93 of the pad. When a pad is connected to a central station 64 that is already in use, the microcontroller 94 may immediately begin providing signals over the SCLK lines 86a, 86b, 86c and 86d and the  
10 SDATA lines 88a, 88b, 88c and 88d associated with the newly connected pad to read the status of the switch closures of the pad and to update the status of the light emitting diodes 93 of the pad.

Referring now to FIGS. 8 and 9, the operation of the logic used in each of the pads 42a, 42b, 42c and 42d to provide the status of the switch closures of the switch matrix  
15 43 to the central station 64 will be described. In a preferred embodiment of the invention, the pads 42a, 42b, 42c and 42d include a programmable logic device, generally indicated at 290, having the components illustrated in the block diagram depicted in Figure 8. While a programmable logic device 290 is depicted, it will be understood by those skilled in the art that the same functions may be carried out by a microcontroller 76 as shown in Figure 4.

20 As described previously, the switch matrix 43 comprises a plurality of switches, such as switches 46, 48, 50, 52, 62a, 62b, 63a, 63b, 51, 53, 57, 59 and 65. As depicted in FIG. 8, the switch matrix 43 may also contain additional switches that may be used to provide additional functions. Each of the switches in the switch matrix 43 is coupled to an input line of an input shift register 300. An input buffer 302 is disposed between each switch of the  
25 switch matrix 43 and the corresponding input line of the input shift register 300.

The input shift register 300 may be a parallel input/serial output shift register. In the embodiment of the invention depicted in FIG. 8, the input shift register 300 has sixteen input lines labeled IN0 to IN15. The state of each of the input lines IN0 - IN15 determines

the value of a single bit of the input shift register 300. For example, closure of switch 59 results in the output of the input buffer 302 connected to switch 59 having a voltage increase that causes a binary 1 to be stored in the bit connected to input line IN0 when the shift register 300 is triggered to load. Similarly, when switch 59 is open, the output of the input  
5 buffer 302 connected to input line IN0 is low, resulting in a binary 0 being stored in the bit connected to input line IN0 when the input shift register 300 is triggered to load. Since each switch of the switch matrix 43 is connected to a corresponding one of the input lines IN0 - IN15 of the input shift register 300, the state of each of the switches of the switch matrix 43 may be captured simultaneously, or on a parallel basis, with the state of the other switches,  
10 by the input shift register 300.

The SDATA line 88 may be driven by either the microcontroller 94 in the central station 64 or the programmable logic device 290 of the pad 42a, 42b, 42c and 42d. When the SEL% 84 line is driven by the microcontroller 94 of the central station 64, it is driven with a signal that may be an alternating signal. This alternating signal is input into a  
15 Schmidt trigger 304 which results in a signal on line 308 having high and low states, as depicted in FIG. 9. Similarly, the SCLK signal on line 86 is input into a Schmidt trigger 306 resulting in a signal on line 310 having alternating high and low states. While Schmidt triggers 304, 306 are described, any input buffer may be used. The SDATA line 88 is enabled to be driven by the pad whenever the SEL% signal on line 308 is high (the read state); thus, the microcontroller 94 stops sending data signals over line SDATA 88 before  
20 providing a signal over line SEL% 84 to set line SEL% 308 high.

The sequence of operations comprising the determination of the status of the switch closures of the switch matrix 43 will now be described with reference to the block diagram of the programmable logic device depicted in Figure 8 and the timing diagram  
25 generally indicated at 400 in Figure 9. As depicted on timing diagram line 402 of Figure 9, the signal on line SEL% 308 is driven high while the signal on SCLK line 310 is low (timing diagram line 406, Figure 9). The transition from low to high on line 308 is input into a clock-in line of a flip flop 312 that is responsive to line 310 being driven high to drive the prime signal on line 314 high. This transition is depicted at 420 in Figure 9. The high prime

signal on line 314 is input to flip flop 316 which also receives a clock-in signal from SCLK line 310. When the SCLK signal on line 310 is driven high (Figure 9, timing diagram line 406), the flip flop 316 causes the signal on the loadreg line 318 to go high (Figure 9, transition 424), asserting the loadreg signal to the shift register 300. The signal on the loadreg line 318 is also input into the CLR input line of the flip flop 312. The high level of the signal on the loadreg line 318 resets flip flop 312, causing the signal on the prime line 314 to go low (Figure 9, transition 426).

The combination of a low signal on the prime line 314 and the next transition of the SCLK signal on line 310 from low to high causes the flip flop 316 to reset the signal on the loadreg line 318 to low (Figure 9, transition 430). The assertion of SCLK while loadreg is high causes the input shift register to capture the signals on the input lines IN0-IN15 representative of the state of the switch closures of the switch matrix 43 in a parallel fashion. Each subsequent transition of the signal on the SCLK line 310 from low to high (Figure 9, timing diagram line 406) while the signal on the loadreg line 318 is low (Figure 9, timing diagram line 408) drives the shift register 300 to serially shift the one of the bits of data stored in the shift register 300 out of the shift register 300 through an output line 322 and an output enableable driver 326 onto the SDATA line 88. As can be seen in FIG. 8, the SEL% line 308 is also connected to the enabler input 324 of the output enableable driver 326. When the signal on the SEL% line 308 is high the output enableable driver 326 allows the signal on line 324 to pass through the output enableable driver 326 onto SDATA line 88, which is being monitored by the microcontroller 94 of the central station 64. The data signal on line 88 also passes through a Schmidt trigger input buffer 344 onto line 330 which is connected to the in line 332 of the shift register 90. In this arrangement, the signal that is present on the SDATA line 88, whether driven by the pad 42a or the central station 64, is present on line 330 and at the in line 332 of the shift register 90.

When the microcontroller 94 of the central station 64 has completed the interrogation cycle to read the status of the switch closures of the pads 42a, 42b, 42c and 42d, the microcontroller 94 sends a signal on line SEL% 84 to set the signal on line 308 low (Figure 9, timing diagram line 454). Setting the signal on line 308 low turns off the output

enableable driver 326, halting the flow of data onto the SDATA line 88 from line 322. SDATA line 88 may now be driven by microcontroller 94 of the central station to send signals to the pad to update the status of the light emitting diodes 93 on the pad (Figure 2).

5 The operation of the programmed logic device 290 to update the status of the light emitting diodes 93 (Figure 2) of the pads will now be described with reference to Figure 8 and the timing diagram generally indicated at 450 in Figure 9. As shown in FIG. 8, the SCLK signal on line 310 is used to drive the input and CLR lines of the flip flop 328. The SEL% signal on line 308 is used to drive the output of an inverter 340 to provide a clock signal to the clock-in port of the flip flop 328. In this manner, when the SEL% signal on line  
10 308 is high, the signal on line 350 will be low, and when the SEL% signal on line 308 is low, the signal on line 350 will be high.

The SEL% and SCLK signals on lines 350 and 310 are used to drive the output of an and gate 342 to provide a signal on line 352 to the clock-in port 336 of the shift register 90. In this arrangement, the signal on line 352 is high when the SCLK signal on line 310 is high and the inverted SEL% signal on line 350 is high. In this way, the signal on line 352  
15 is high only when the microcontroller 94 in the central station 64 is not interrogating the pad to capture data from the input shift register 300.

When the SCLK signal on line 310 is driven high when the signal on line 350 is high (SEL% line 84 being low), the flip flop 328 drives the signal on the outres line 338 high (Figure 9, transition 472). When the signal on line 310 transitions from high to low, the  
20 signal on the outres line 338 is driven low and is asserted to the reset line 334 of the shift register 90 (Figure 9, transition 476). Since the signal on line 350 is high as a result of the inversion of the low signal on line 308 by inverter 340, each subsequent transition of the SCLK signal on line 310 from low to high satisfies the condition of the and gate 342 and is  
25 asserted to the clock-in line 336 of the shift register 90. Each subsequent clock signal on line 352 while the signal on outres line 338 is low shifts the value of the SDATA signal on line 330 at in line 332 of the shift register 90 to be shifted into the output line out0 of the shift

register 90. Each successive clocking of the shift register 90 by a transition of the signal on line 352 from low to high shifts the data in each of the registers of the shift register 90 to the next higher output line. For example, the next clock signal on line 352 will shift the value on the out0 line to the out1 line and so forth. The output of the output lines of the shift register 90 are then utilized by the output drivers 354 to light the selected LED of the LED bank 93 (Figure 9, timing diagram lines 452, 458).

It will be understood that the flow of data on line 88 is sequenced with the signals provided on the SEL% line 84 and the SCLK line 86. For example, when a vehicle identified by the Arabian numeral "4" has been selected by the operator of pad 42a, the microcontroller 94 will drive the signal on the SEL% line 84 low while the signal on the SCLK line 86 is high, causing the flip flop 338 to drive the signal on the outres line 338. Setting outres line 338 asserts a reset signal to the reset line 334 of the shift register 90, and also disables the flow of data from the pad to the central station 64.

When the signal on the SCLK line next transitions from high to low (Figure 9, transition 476), the signal on the outres line is driven low, enabling the shift register 90 to accept data on line 330 from the microcontroller 94 of the central station 64. The microcontroller 94 sets the signal line SEL% 84 low. The next time the SCLK signal on line 86 is driven high by the microcontroller 94, shift register 90 will shift the value of the SDATA line 330 (which is high) to the out0 register of the shift register 90 (Figure 9, timing diagram lines 452, 458). The microcontroller 94 then drives the signal on the SDATA line 88 low, which drives the signal at the in line of the shift register 90 low. The microcontroller 94 then drives the signal on the SCLK line 86 from low to high and back to low four times, each time causing the signal on line 352 to transition from low to high and back to low, which results in the shift register 90 shifting the value of the out0 line to the out1 line, then to the out2 line and lastly to the out3 line, which results in the fourth LED in the LED bank to be lit, indicating that the user of the pad 42a has selected the vehicle identified with the Arabian "4". Because the signal on the SDATA line has been driven low, there is no data present at the in port 332 of the shift register 90 to shift into the output register out0 as the

data in the output register out0 is shifted in the out1 register. Thus, each of the registers out0, out1 and out2 are set to binary 0, and the LED's associated with those registers are not lit.

The system and method described above have certain important advantages. They provide for the operation of a plurality of vehicles by a plurality of users, either on a competitive or a co-operative basis. Furthermore, the vehicles can be operated on a flexible basis in that a vehicle can be initially selected for operation by one user and can then be selected for operation by another user after the one user has failed to operate the vehicle for a particular period of time. The vehicles being operated at each instant are also visible by the illumination of the lights 134 on the vehicle. The apparatus and method of this invention are also advantageous in that the vehicles are operated by the central station 64 on a wireless basis without any physical or cable connection between the central station and the vehicles.

Furthermore, the central station 64 is able to communicate with the vehicles in the plurality through a single carrier frequency. The system and method of this invention are also advantageous in that the vehicles can selectively perform a number of different functions including movements forwardly and rearwardly and to the left and the right and including movements of a container or bin or platform on the vehicle upwardly and downwardly or to the left or the right. Different movements can also be provided simultaneously on a coordinated basis.

There are also other significant advantages in the system and method of this invention. Two or more systems can be combined to increase the number of pads 42 controlling the operation of the vehicles 12, 14, 16 and 17. In effect, this increases the number of users capable of operating the system. This combination of systems can be provided so that one of the systems is a master and the other is a slave. This prevents any confusion from occurring in the operation of the system. The system is also able to recharge the batteries in the vehicles so that use of the vehicles can be resumed after the batteries have been charged.



The system and method of this invention are also advantageous in the provision of the pads and the provision of the button and switches in the pads. As will be appreciated, the pads are able to select vehicles and/or stationary accessories through operation of a minimal number of buttons and to provide for the operation of a considerable number of  
5 different functions in the vehicles with a minimal number of buttons. In co-operating with the central station, the pads are able to communicate the selection of vehicles to the central station without indicating to the station, other than on a time shared basis, the identities of the vehicles being selected. After selecting a vehicle, each pad does not thereafter have to indicate the identity of the vehicle as long as the pad operates the vehicle through the central  
10 station within a particular period of time from the last operation of the vehicle by the pad through the central station.

While several forms of the invention have been illustrated and described, it will also be apparent that various modifications can be made without departing from the spirit and scope of the invention. Accordingly, it is not intended that the invention be limited, except  
15 by the appended claims.

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application in the manner provided by the first paragraph of Title 35, United States Code, Sec. 112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, Sec. 1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application.

<u>Appln. Serial No.</u>	<u>Filing Date</u>	<u>Status</u> (patented, pending abandoned)
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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.


I hereby appoint the following attorneys to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith:

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FIG. 1

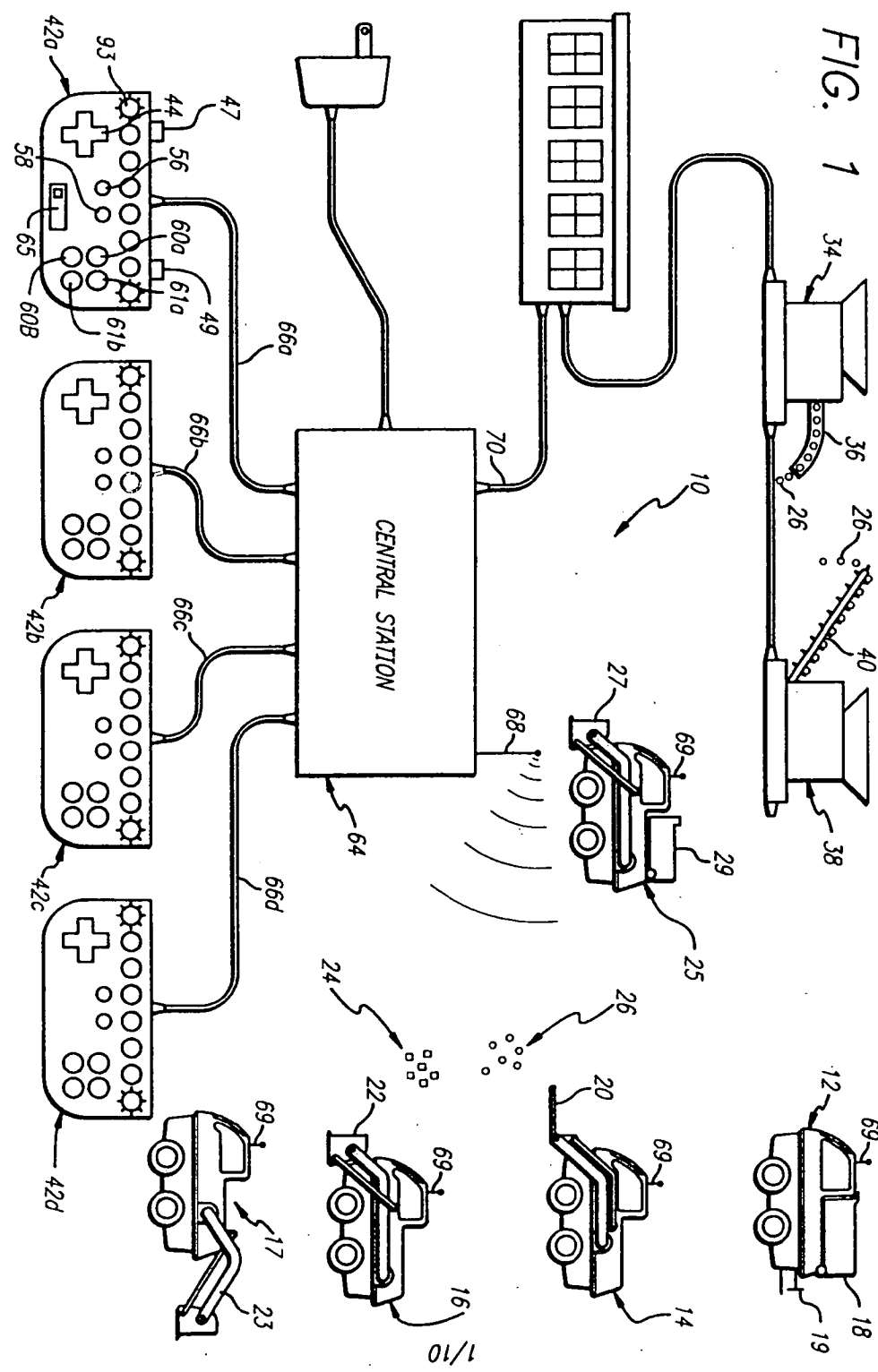


FIG. 2

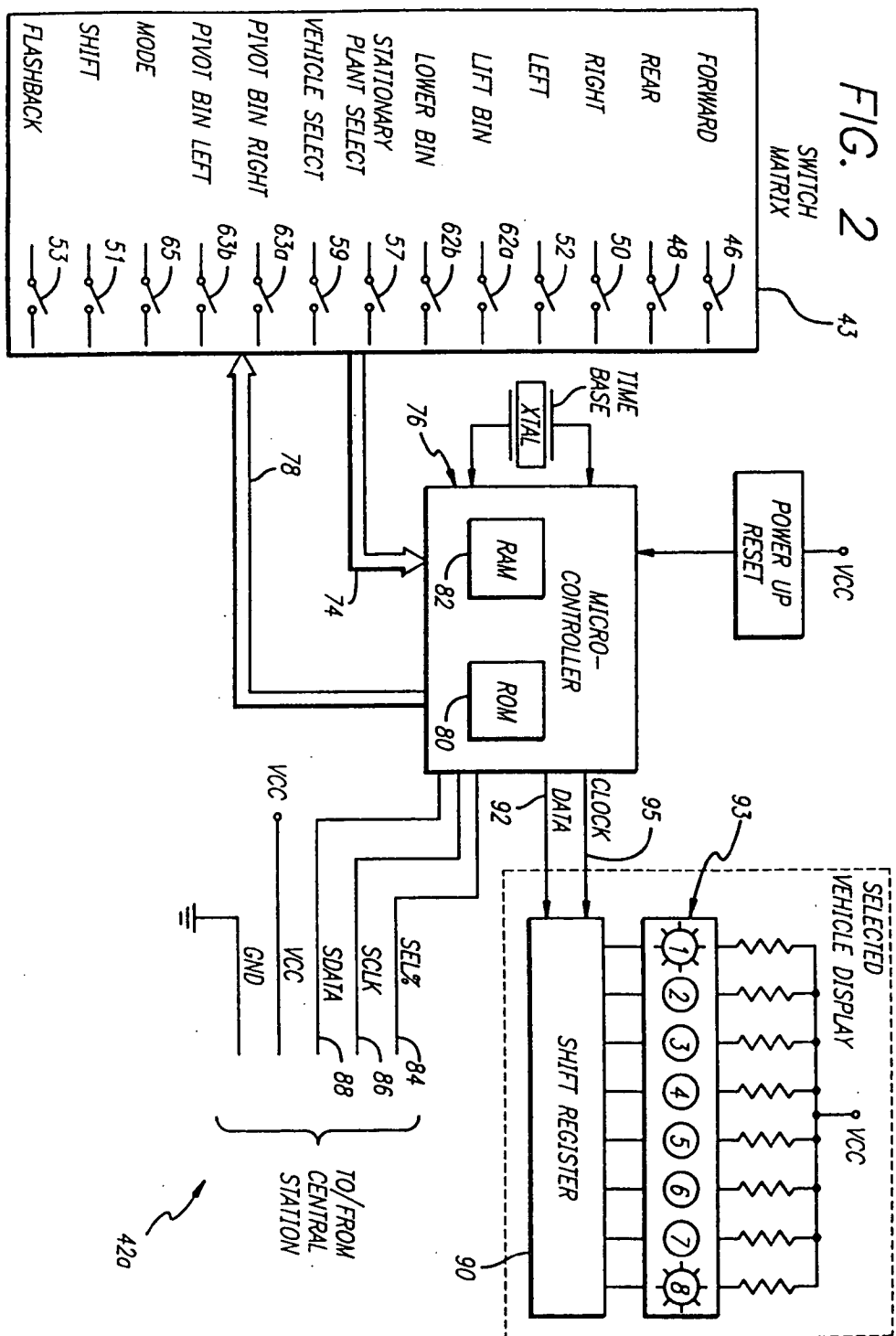


FIG. 3

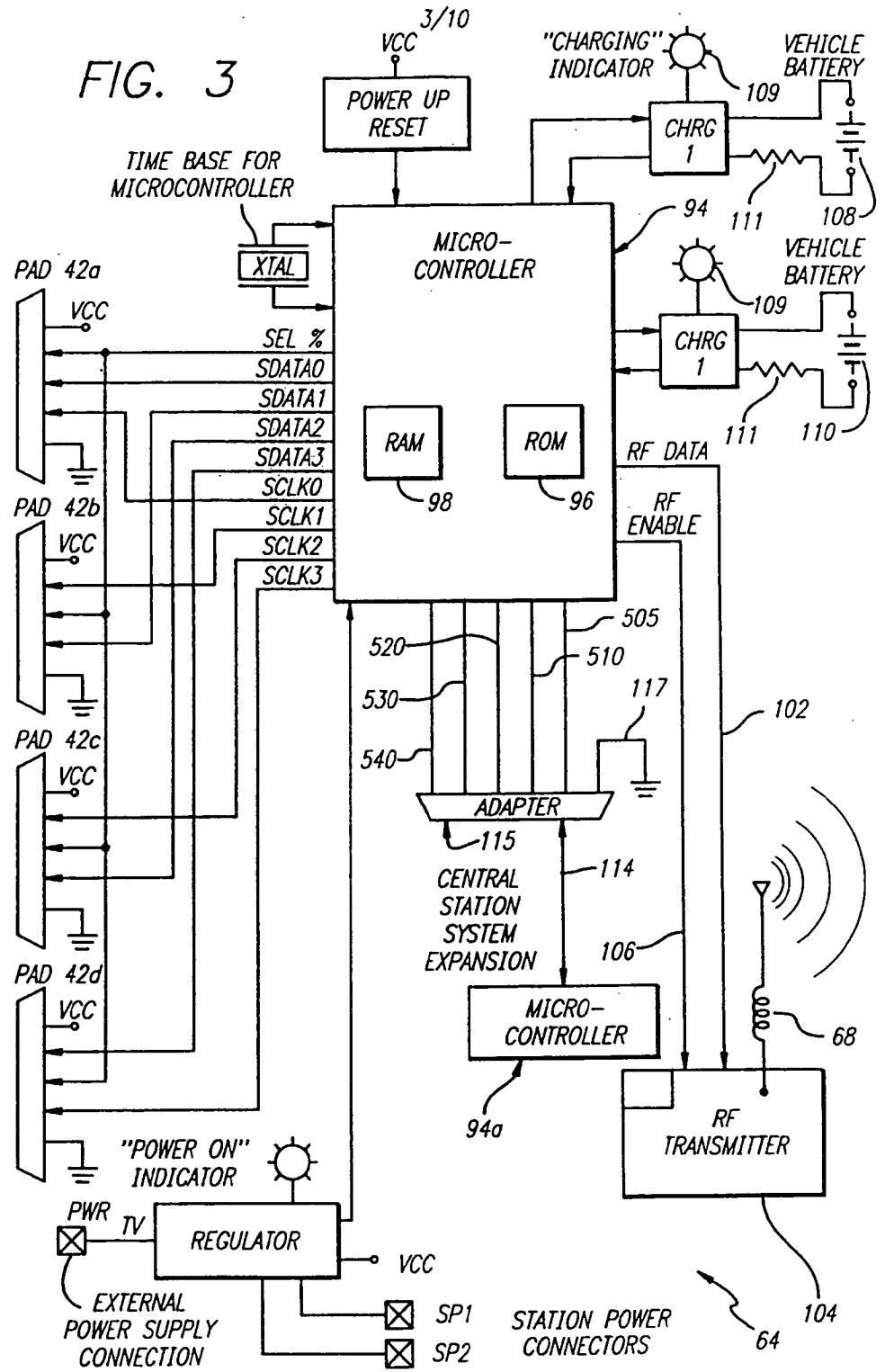
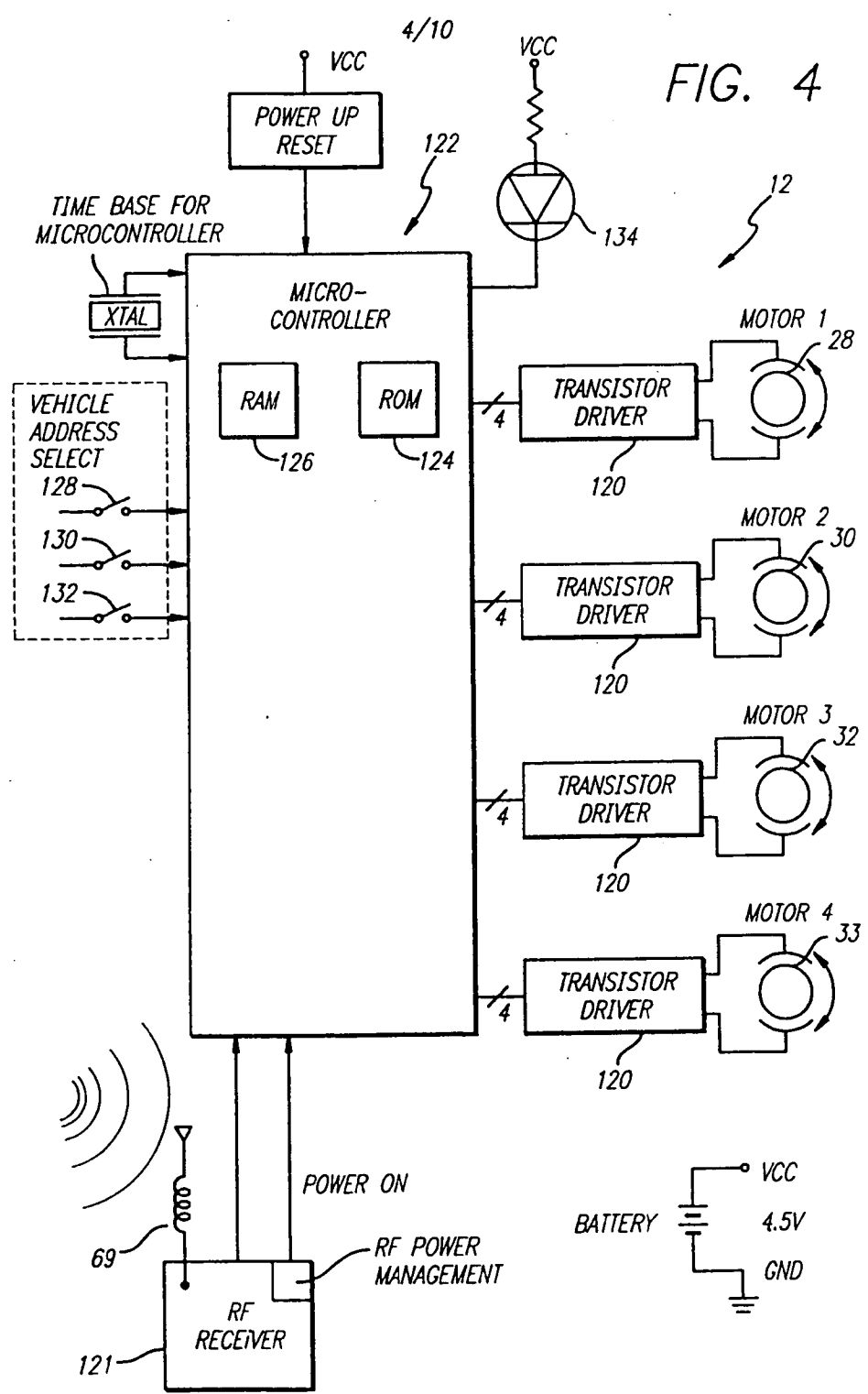


FIG. 4





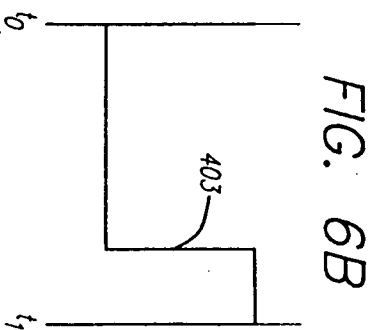
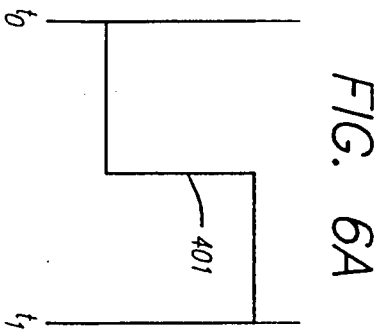
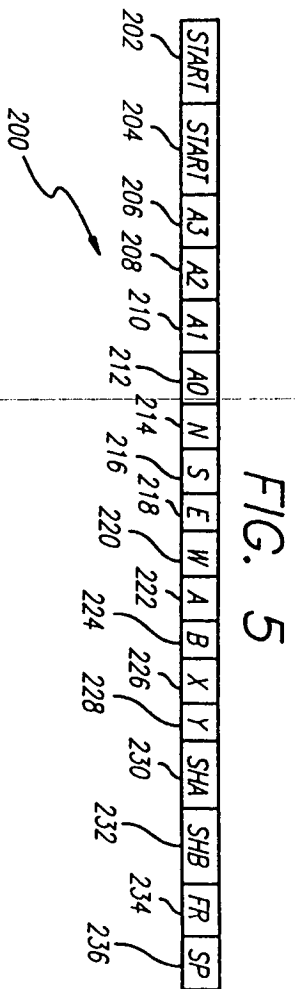
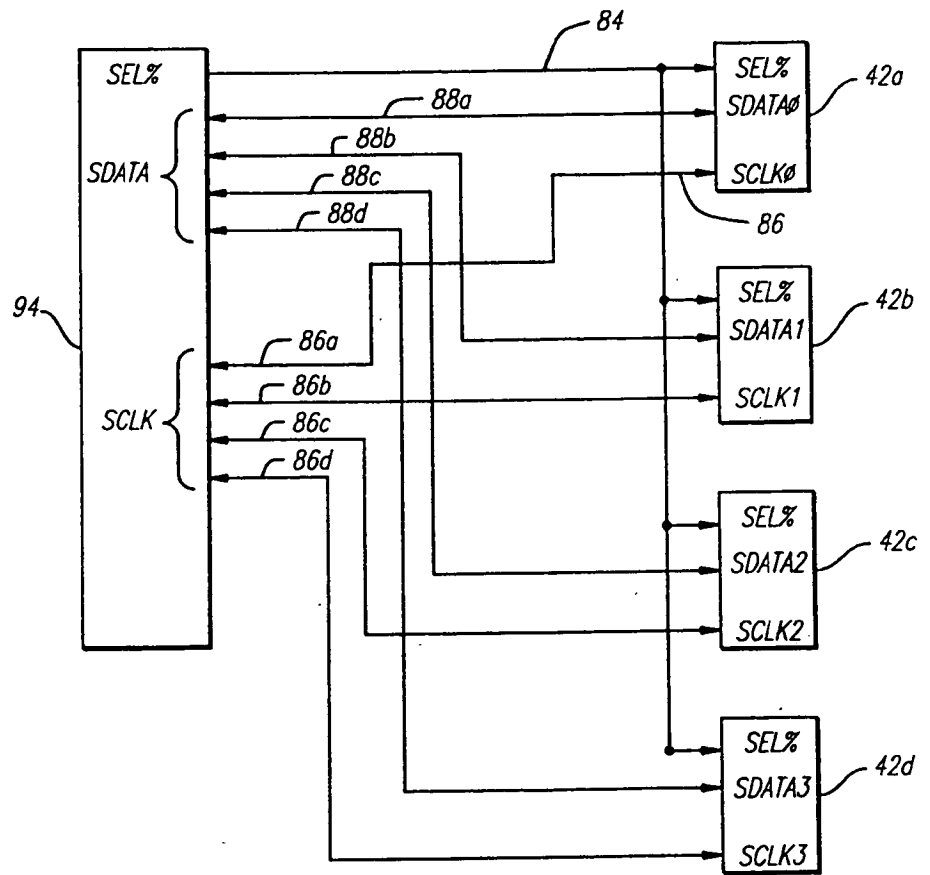


FIG. 7



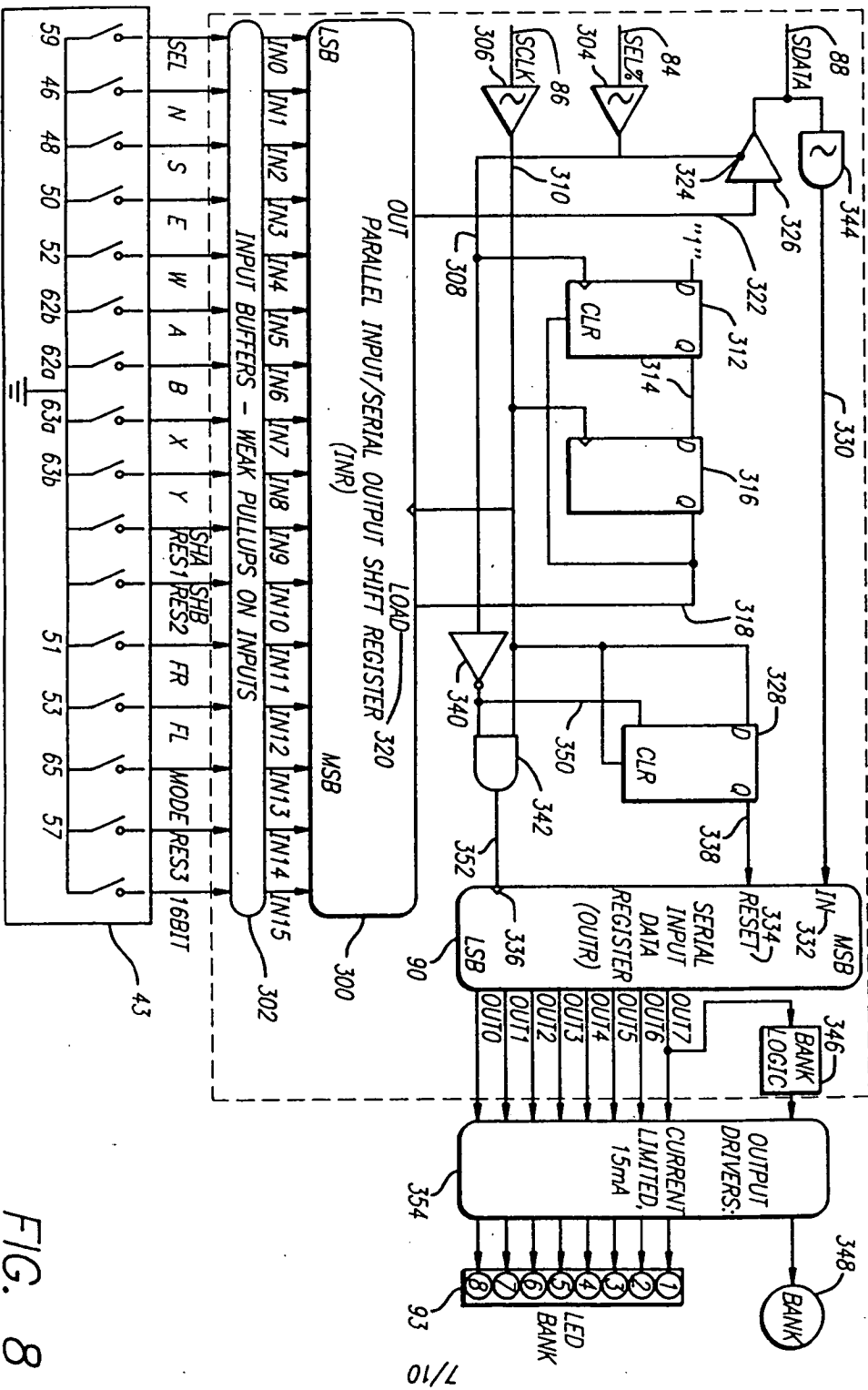


FIG. 8

FIG. 9-1

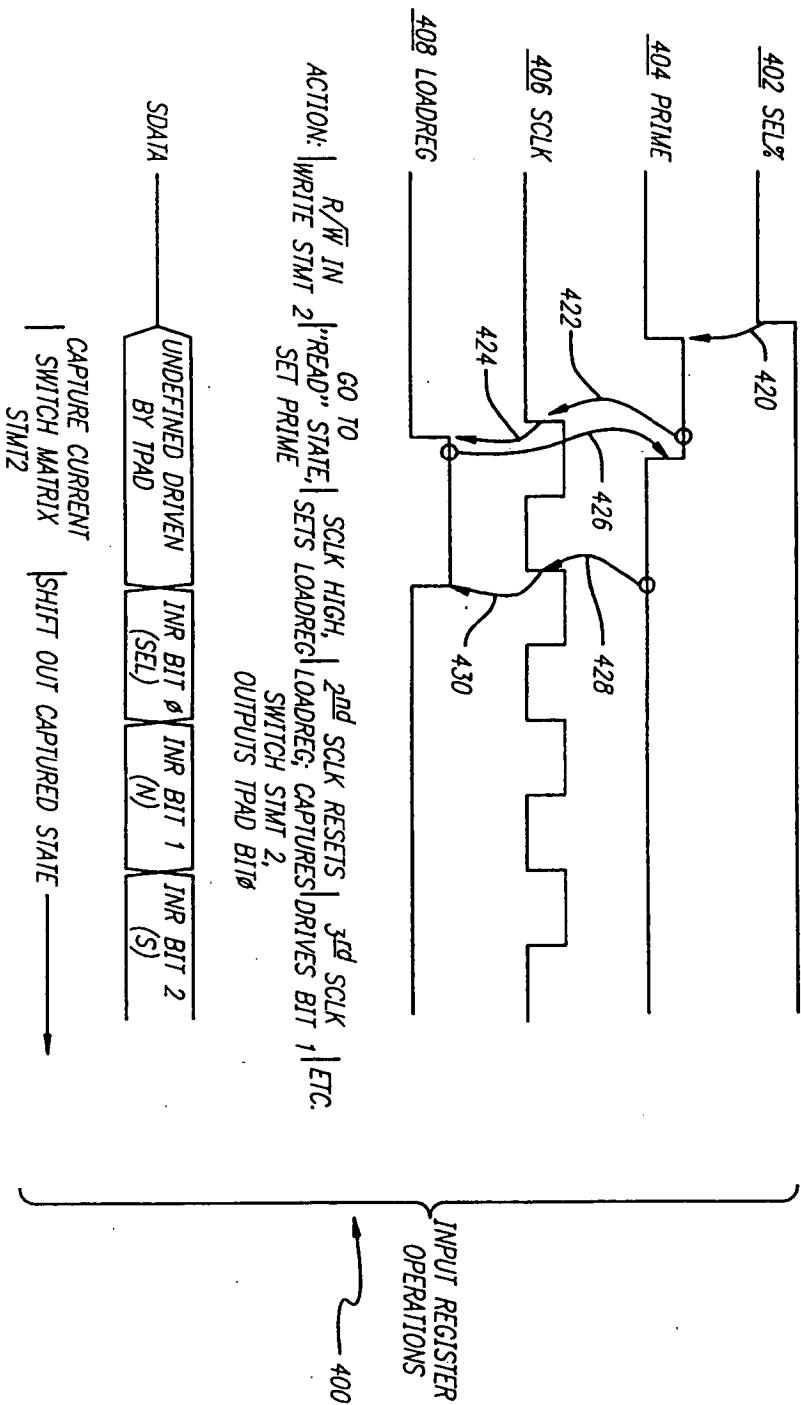


FIG. 9-2

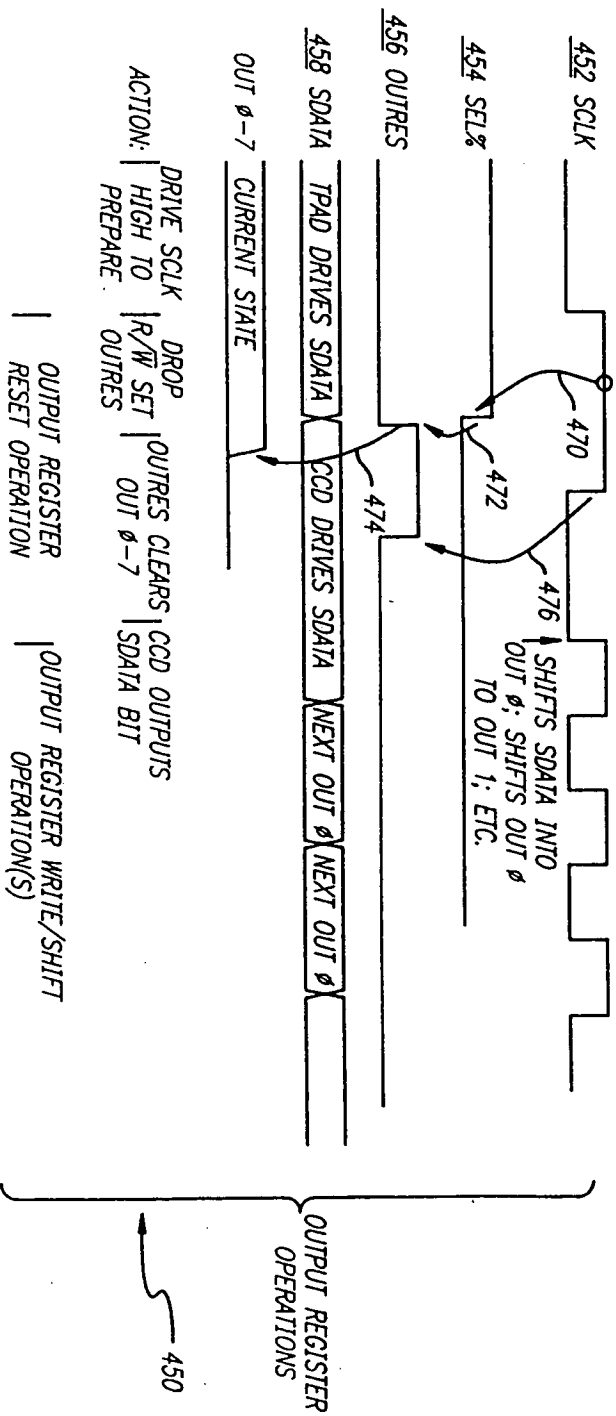


FIG. 10 CENTRAL STATION

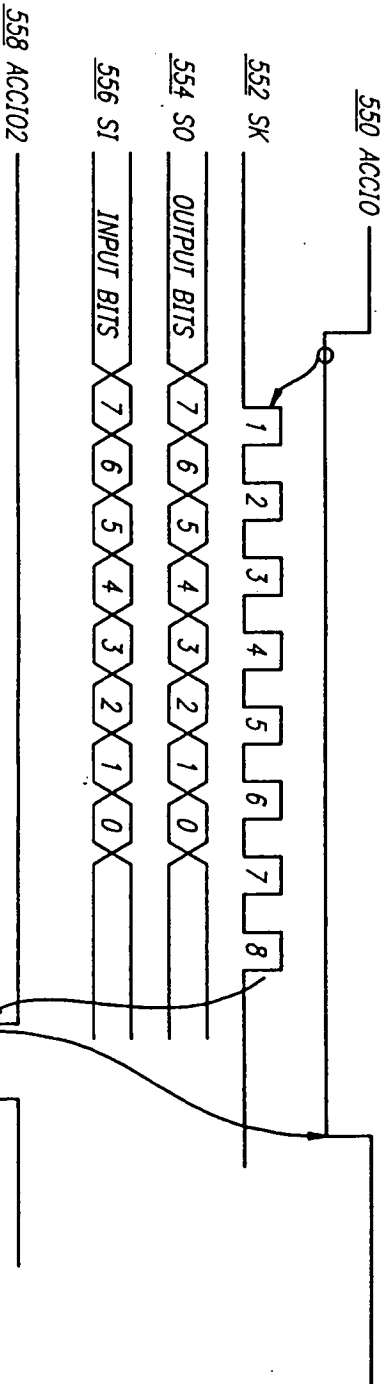
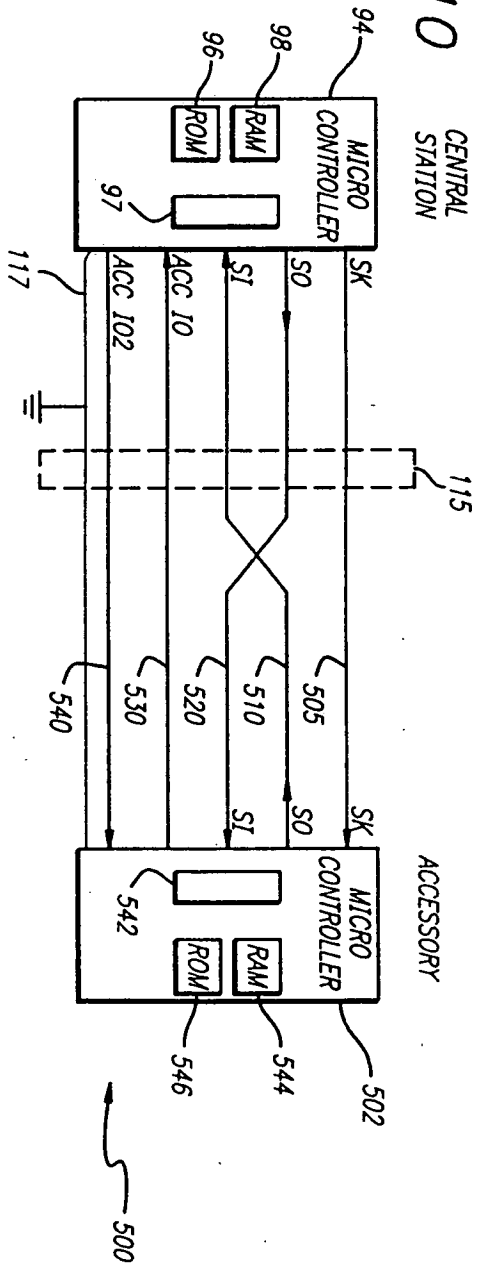


FIG. 11

10/10

I Claim:

1. In combination with use in a system including a plurality of vehicles each responsive to an individual address and to a plurality of commands for providing individual operations of such vehicles in accordance with such commands,

5 a plurality of pads, each individual one of the pads including a plurality of switches for providing an address to select an individual one of the vehicles and for providing commands to such individual one of the vehicles for operating such individual one of the vehicles in accordance with such commands,

10 a central station responsive to the closure of the switches in each individual one of the pads for sending the address and the commands to the individual one of the vehicles,

there being an additional switch on each individual one of the pads with first and second states of operation, the additional switch in each individual one of the pads providing for the operation of the individual one of the vehicles by only such individual one of the pads and providing in the second state for the operation of the individual one of the vehicles by another  
15 one of the pads in addition to the individual one of the pads, and

means in the central station for providing for the operation of the vehicle by the individual one of the pads and the additional one of the pads when the additional switch in the individual one of the pads is in the second state.

2. In a combination as set forth in claim 1,

each of the pads including, in the plurality of switches, first switches for controlling the movements of the individual one of the vehicles and including, in the plurality of switches, second switches for controlling other operations of the vehicles than the movements of the  
5 vehicles,

means responsive in the central station to the operation of the first switches in the individual one of the pads for providing controlled movements of the individual one of the vehicles and responsive in the central station to the operation of the second switches in the

individual one of the pads for providing controlled operations of the individual one of the  
10 vehicles other than the movements of such vehicle.

3. In a combination as set forth in claim 2,

means responsive in the central station to the operation of the additional one of the  
switches in the individual one of the pads in the second state and to the operation of the first  
switches in the individual one of the pads and the additional one of the pads for providing  
5 controlled movements of the individual one of the vehicles and responsive in the central station  
to the operation of the second switches in the individual one of the pads and the additional one  
of the pads for providing controlled operations of the individual one of the vehicles other than  
the movements of such vehicle.

4. In combination in a central station for use with a plurality of pads and a plurality of  
vehicles wherein each of the pads includes a plurality of switches for controlling the operation  
of an individual one of the vehicles,

first means responsive in the central station to the closure of first switches in the plurality  
5 in an individual one of the pads in a pattern for producing first signals providing an address  
identifying an individual one of the vehicles,

second means responsive in the central station to the closure of second switches in the  
plurality in the individual one of the pads for producing second signals providing for an operation  
of the individual one of the vehicles in accordance with such switch closures, and

10 third means responsive in the central station to the closure of a third switch in the  
plurality in the individual one of the pads for providing for an operation of the individual one of  
the vehicles by a second one of the pads simultaneously with the operation of the individual one  
of the vehicles by the individual one of the pads, and

fourth means in the central station for sending to the individual one of the vehicles the  
15 first signals providing the address identifying the individual one of the vehicles and the second  
signals providing commands for obtaining the operation of the vehicle in accordance with the  
pattern of closure of the second switches.



5. In a combination as set forth in claim 4,

the first means being responsive in the central station to the closure of first switches in a second one of the pads in the pattern for producing third signals providing an address identifying the individual one of the vehicles,

5 the second means being responsive in the central station to the closure of second switches in the second one of the pads for producing fourth signals providing for the operation of the individual one of the vehicles in accordance with such switch closures,

10 the fourth means being operative in the central station to send to the individual one of the vehicles from the second one of the pads, simultaneously with the sending to the individual one of the vehicles from the individual one of the pads, the third signals providing the address identifying the individual one of the vehicles and the fourth signals providing commands for obtaining the operation of the vehicle in accordance with the pattern of closure of the second switches in the second one of the pads.

6. In combination for controlling the operation of an individual one of a plurality of vehicles,

5 a handheld pad including a first switch operable in a pattern providing an address of the individual one of the plurality of vehicles and including a plurality of switches individually operable in a pattern providing for operations of the individual one of the vehicles in accordance with the pattern of closures of such switches,

means in the handheld pad for providing a plurality of light indications each for an individual one of the vehicles in the plurality,

10 means in the handheld pad for providing first light indications for the vehicles in the plurality when such handheld pad has not provided an address for any of the vehicles in the plurality, and

means in the handheld pad for providing a second illumination for the individual one of the vehicles when the handheld pad provides the address for such individual one of the vehicles.

7. In a combination as set forth in claim 6,

there being a plurality of handheld pads,

each of the handheld pad including a switch sequentially operative to select successive ones of the vehicles in the plurality, and

5 means responsive in the handheld pad to the sequential operations of the switch for skipping the selection by the handheld pad of a vehicle in the plurality which has previously been addressed by another one of the pads in the plurality.

8. In a combination as set forth in claim 6,  
the first light indications constituting a sequential activation of the light indications in the plurality on a cyclic basis, and

5 means in the handheld pad for discontinuing the sequential activation of the light indications in the handheld pad and for providing a continuous activation of an individual one of the light indications in such pad when such pad is operated to address the vehicle represented by such individual one of the light indications.

9. In combination for operating a vehicle in accordance with addresses and commands provided by a pair of handheld pads and transmitted by a central station to the vehicle,

means in the vehicle for receiving the addresses and commands provided by the pads and transmitted by the central station,

5 means in the vehicle for identifying the received addresses as those of the vehicle,

means responsive in the vehicle to the identification of the addresses received from the pads as those of the vehicle for executing the received commands from the handheld pads when the received commands are complementary, and

10 means responsive in the vehicle to the identification of the received addresses as those of the vehicle for ignoring the received commands from the handheld pads when the received commands are contradictory.

10. In a combination as set forth in claim 9,

means responsive in the vehicle to the discontinuance of one of the pads in the plurality in addressing the vehicle for continuing the response of the vehicle to the addresses and commands from the other one of the pads in the pair.

11. In combination for use in a system including a plurality of vehicles each responsive to an individual address and to a plurality of commands for providing individual operations of such vehicle in accordance with such commands,

5 a plurality of pads each operative to provide an address for selecting an individual one of the vehicles and to provide commands to such individual one of the vehicles for operating such individual one of the vehicles in accordance with such commands,

a central station responsive to the address and the commands from each of the pads for sending the address and the commands from such pad to the vehicle selected by such pad to obtain an operation of such vehicle in accordance with such commands, and

10 means in the central station for obtaining the interrogation at each instant of only the pads in the plurality that are providing addresses and commands to obtain the operation of vehicles in the plurality.

12. In a combination as set forth in claim 11,

means in the central station for transmitting the addresses and commands from the interrogated pads to the vehicles in the plurality to obtain the operation, in accordance with such commands, of the vehicles addressed by the central station on the cyclic basis.

13. In a combination as set forth in claim 12,

each of the pads including a switch having first and second states of operation and operative in the first state to provide an operation of an individual one of the vehicles in the plurality only by such pad and operative in the second state to provide for the operation of such individual one of the vehicles simultaneously by such pad and another one of the pads.

14. In combination,

a plurality of operative members,

a plurality of pads, each individual one of the pads including first and second pluralities of switches each having first and second operative relationships, the first switches having the

5 second operative relationship in a pattern providing an address to select an individual one of the operative members and the second switches having the second operative relationship in a pattern providing for a controlled operation of the individual one of the operative members,

10 a central station having first and second states of operation, the central station being responsive in the first state of operation of the central station to the individual pattern of the first switches in the second state of operation of the first switches for producing a plurality of signals representing the address of the individual one of the vehicles and being responsive in the first state of operation to the individual pattern of the second switches in the second state of operation of the second switches for producing a second plurality of signals providing a first controlled operation of the individual one of the operative members,

15 the central station being responsive in the second state of operation of the central station to the individual pattern of the second switches in the second state of operation of the second switches for producing a third plurality of signals for providing a second controlled operation of the individual one of the operative members different from the first controlled operation of the individual one of the operative members.

20 15. In a combination as set forth in claim 14,

means for sending to the operative members the first and second pluralities of signals in the first state of operation of the central station and the first and third pluralities of signals in the second state of operation of the central station.

16. In combination,

a plurality of vehicles,

5 a plurality of pads, each individual one of the pads including a plurality of switches having open and closed states of operation for providing an address to select an individual one of the vehicles and for providing commands to such individual one of the vehicles for operating such individual one of the vehicles in accordance with such commands,

a central station responsive to the closure of the switches in each individual one of the pads for sending the commands to the individual one of the vehicles addressed by such individual one of the pads,

10 means in the vehicles for powering the vehicles to perform the commands sent to the vehicles by the central station,

means in the central station for determining in each progressive particular period of time whether any of the pads has provided addresses and commands to any of the vehicles, and

15 means in the central station for providing commands to the vehicles to depower the vehicles when the central station has determined that none of the pads has provided addresses and commands to any of the vehicles in one of the progressive particular periods of time.

17. In a combination as set forth in claim 16,

means responsive in the vehicles to the addresses and commands from the central station for performing the commands addressed to such vehicles by the central station, and

5 means responsive in the vehicles to the depowering commands from the central station for depowering such vehicles.

18. In combination,

a plurality of vehicles,

5 a plurality of pads, each individual one of the pads including a plurality of switches having open and closed states for providing an address to select an individual one of the vehicles and for providing commands to such individual one of the vehicles for operating such individual one of the vehicles in accordance with such commands,

a central station responsive to the closure of the switches in such individual one of the pads for sending the commands to the individual one of the vehicles addressed by such individual one of the pads,

10 first means including a memory in the central station for storing in the memory the identity of the individual one of the vehicles last addressed by such individual one of the pads, and

second means in the central station for providing for the selection again by such individual one of the pads of the individual one of the vehicles stored in the memory for such individual one of the pads after such individual one of the pads has selected one of the vehicles other than the individual one of the vehicles or after the individual one of the pads has failed to provide a command to the individual one of the vehicles for a particular period of time.

19. In a combination as set forth in claim 18,

each of the pads including a switch having open and closed states and operable to the closed state on a repetitive basis for a particular number of times to select the individual one of the vehicles, each of the pads including additional switches having open and closed states and operable to the closed state to provide the commands for operating the individual one of the vehicles, and

the second means in the central station being responsive to the operation of any of the additional switches to the closed state, after such individual one of the pads has selected one of the vehicles other than the individual one of the vehicles or after the individual one of the pads has failed to provide a command to the individual one of the vehicles for a particular period of time, for providing for the selection again by such individual one of the pads of such individual one of the vehicles.

20. In combination for use with a central station and a plurality of vehicles for selecting and operating individual ones of the vehicles in accordance with addresses and commands provided by the central station,

a hand held pad,

a first switch in the pad, the first switch having open and closed states and operable on a repetitive basis to the closed state for a particular number of times to select an individual one of the vehicles to be addressed by the central station,

a plurality of additional switches in the pad, the additional switches having open and closed states and being operable to the closed state in a particular pattern to obtain the operation of the individual one of the vehicles in accordance with the pattern of closure of the additional switches,

a plurality of light indications in the pad, each of the light indications being associated with a different one of the vehicles in the plurality,

means for energizing the light indications in sequence on a cyclic basis before any closures of the first switch to select the individual one of the vehicles in the plurality, and

means for continuously energizing the individual one of the light indications associated with the individual one of the vehicles when the first switch in the pad has been operated to the closed state on the repetitive basis for the particular number of times to select the individual one of the vehicles to be addressed by the central station.

21. In a combination as set forth in claim 20,

the pad constituting a first pad,

there being a plurality of additional pads each having the same construction as the first pad, and

means for skipping the light indications in the first pad of the vehicles selected by the additional pads when the first switch in the first pad is operated to the closed state on the repetitive basis.

22. In a combination as set forth in claim 20,

means for sending to the central station a first plurality of binary indications representing the repetitive operation of the first switch in the pad to the closed state to provide an address by the central station for the individual one of the vehicles in the plurality and a second plurality of binary indications representing the pattern of closure of the additional switches in the pad to provide the commands by the central station for operating the individual one of the vehicles.

23. In combination for use in a system including a plurality of vehicles each responsive to an individual address and to a plurality of commands for providing individual operations of vehicles in accordance with such commands,

a plurality of pads each operative to provide an address for selecting an individual one of the vehicles and to provide commands to such individual one of the vehicles for operating such individual one of the vehicles in accordance with such commands,

a central station connected to the pads,

first means in the central station for interrogating the pads to determine the address and the commands provided by such pads,

10 second means responsive in the central station to the interrogation provided by the first means in the central station concerning the address and the commands from each pad for sending the address and the commands from such pad to the vehicle addressed by such pad to obtain an operation of such vehicle in accordance with such commands,

15 the first means in the central station being operative to interrogate any additional pad connected to the central station, and

the second means being responsive in the central station to the interrogation provided on the cyclic basis by the first means in the central station concerning the address and the commands from the pads in the plurality and from the additional pad for sending signals representing the address and the commands from each such pad to the vehicle addressed by such pad to obtain  
20 an operation of such vehicle in accordance with such commands.

24. In a combination as set forth in claim 23,

third means in the central station for transmitting at each instant only the commands from the pads which are providing changes in commands at that instant.

25. In a combination as set forth in claim 23,

the first means being operative to eliminate any of the pads disconnected in the plurality from the central station.

26. In combination for use in a system including a plurality of vehicles each responsive to an individual address and to a plurality of commands for providing individual operations of vehicles in accordance with such commands,



a plurality of pads each operative to provide an address for selecting an individual one  
5 of the vehicles and to provide commands to such individual one of the vehicles for operating  
such individual one of the vehicles in accordance with such commands,

a central station connected to the pads,

first means in the central station for interrogating the pads to determine the address and  
the commands provided by such pads,

10 second means responsive in the central station to the interrogation provided by the first  
means in the central station concerning the address and the commands from each pad for sending  
signals representing the address and the commands from such pad to the vehicle addressed by  
such pad to obtain an operation of such vehicle in accordance with such commands,

the first means in the central station being operative to eliminate, from the interrogation  
15 any of the pads disconnected in the plurality from the central station,

the second means being responsive in the central station to the interrogation provided by  
the first means in the central station concerning the address and the commands from the pads  
interrogated by the central station for sending the signals representing the address and the  
commands from each such pad to the vehicle addressed by such pad to obtain an operation of  
20 such vehicle in accordance with such commands.

27. In a combination as set forth in claim 26,

third means in the central station for transmitting at each instant only the commands from  
the pads which are providing changes in commands at that instant.

28. In combination for use in a system including a plurality of vehicles each responsive  
to an individual address and to a plurality of commands for providing individual operations of  
vehicles in accordance with such commands,

a plurality of pads each including a first switch having open and closed states and  
5 operative to provide an address to an individual one of the vehicles dependent upon the number  
of such switch closures and including a plurality of switches each having open and closed states  
and operative in the closed state to provide a particular operation of the individual one of the  
vehicles,

10 a central station responsive to the closures of the first switch in each of the pads for providing an address to an individual one of the vehicles dependent upon the number of such switch closures in such pad and responsive to the closures of the second switches in such pad for providing signals representing operations to be performed by such individual one of the vehicles, and

15 means responsive in the central station to the closures of individual pairs of the second switches providing in each of the pads contradictory commands to the individual one of the vehicles for converting such contradictory commands to signals providing specialized commands different from the commands provided by the closure of the different ones of the second switches in such pad.

29. In a combination as set forth in claim 28,

means in the central station for providing at each instant only the commands from the pads which are providing changes in commands at that instant, and

5 means in the central station for sending the vehicles in the plurality the commands provided by the last mentioned means in the central station.

30. In combination for use with a plurality of hand held pads each manually operable to provide signals representing addresses and commands,

5 a central station responsive to the addresses and commands from the hand held pads for providing for each of the pads a first plurality of signals representing the address of an individual one of the vehicles and a second plurality of signals representing the commands for operating such individual one of the vehicles, the first and second pluralities of signals provided at the central station for each of the pads occurring at a particular rate selected in a particular range of rates,

the central station also providing a plurality of start signals at the particular rate,

10 a plurality of vehicles each having an individual address and each including first means responsive to the signals representing the individual address for such vehicle and responsive to the second signals providing the commands for such vehicle for operating such vehicle in accordance with such commands, and

15 means responsive in the vehicle to the start signals from the central station for determining the particular rate of occurrence of the start signals and for providing for the response of the first means in the vehicle, at the particular rate of occurrence of the start signals, to the signals representing the individual address of each vehicle and to the second signals providing the commands for such vehicle.

31. In a combination as set forth in claim 30,  
the central station including a smart port operable on the first and second signals for each pad for modifying such signals to produce, for the vehicle individual to each of the pads, commands different from the commands represented by the second signals for such pad.

32. In a combination as set forth in claim 30,  
the central station being operative in a first mode to provide for the addressing of each individual one of the vehicles by only one of the pads in the plurality and being operative in a second mode to provide for the addressing of  
5 each individual one of the vehicles by two (2) of the pads in the plurality.

33. In combination,  
a plurality of vehicles,  
a plurality of hand held pads each including a first switch having open and closed states and operable in the closed state to select an individual one of the vehicles dependent upon the  
5 number of closures of the first switch and each including a plurality of second switches each having open and closed states, the second switches for each of the pads being operable in the closed state in a pattern providing an operation of the selected vehicle dependent upon such switch closures,  
a central station,  
10 first means in the central station for interrogating the pads in the plurality to determine the number of closures of the first switch and the pattern of closures of the second switches for each of the pads,

second means in the central station for providing, for each of the pads, a first plurality of signals providing an address dependent upon the number of closures of the first switch in such pad and a second plurality of signals providing commands dependent upon the pattern of closure of the second switches in such pad, the first and second signals for each of the pads occurring at a particular rate,

third means in the central station for providing a plurality of start signals at the particular rate,

fourth means responsive in each of the vehicles to the start signals at the particular rate for operating upon the first plurality of signals in each of the pads at the particular rate to identify the address individual to such vehicle and for operating upon the second plurality of signals at the particular rate to identify the commands related to the address individual to such vehicle, and

fifth means for operating each vehicle in accordance with the commands provided for such vehicle.

34. In a combination as set forth in claim 33,

sixth means associated in the central station with the fifth means for transmitting to the vehicles at each instant only the signals representing changes in commands from the pads at that instant.

35. In a combination as set forth in claim 33,

each of the pads including an additional switch having first and second states of operation and providing in the first state of operation for the addressing by such pad of one of the vehicles not addressed at that time by any of the other pads and providing in the second state of operation for the addressing of one of the vehicles addressed at that time by another one of the pads.

36. In combination for use with a plurality of vehicles,

a plurality of pads each operative to identify an individual one of the vehicles addressed by such pad and to provide a plurality of binary indications providing commands for operating the individual one of the vehicles identified by such address,

a central station,

first means operatively coupled in the central station to the pads in the plurality for providing packets of signals identifying for each pad the individual one of the vehicles addressed by such pad and the commands for operating the individual one of the vehicles, and

10 second means responsive in each vehicle to the same identity of the signals providing the commands in two (2) successive packets addressed to such vehicle for operating such vehicle in accordance with the pattern of the signals in such packets.

37. In a combination as set forth in claim 36,

means in the central station for interrogating the pads on a cyclic basis to obtain binary indications from each of the pads, on the cyclic basis with the other pads, of the individual one of the vehicles addressed by such pad and the binary indications providing commands for  
5 operating the individual one of the vehicles.

38. In a combination as set forth in claim 36,

means in the central station for transmitting at each instant only the binary indications from the pads which are providing changes in addresses or commands at that instant.

39. In a combination as set forth in claim 38,

means in the central station for simultaneously interrogating the pads to obtain simultaneous binary indications from the pads of the individual ones of the vehicles addressed by such pads and the binary indications providing the commands for operating the individual  
5 ones of the vehicles.

40. In combination in a vehicle for moving the vehicle in accordance with commands which are provided by a handheld pad to control the movements of the vehicle and which are converted by a central station to commands addressed by the central station to the vehicle to obtain the movements of the vehicle,

5 a pair of left wheels in the vehicle, the left wheels being spaced from each other in a longitudinal direction,

a pair of right wheels in the vehicle, the right wheels having the same spacing in the vehicle in the longitudinal direction as the left wheels,

first means in the vehicle for receiving the commands addressed to the vehicle from the  
10 central station,

a first motor in the vehicle for moving the left wheels in the vehicle in the longitudinal  
direction,

a second motor in the vehicle for moving the right wheels in the vehicle in the  
longitudinal direction,

15 the commands addressed to the vehicle from the central station including first signals for  
operating the first motor and second signals for operating the second motor,

second means responsive in the vehicle to the first and second signals received by the  
vehicle from the central station for normally accelerating the first and second motors in  
progressive increments to the speeds commanded by the central station to such motors for  
20 movement of the vehicle in the longitudinal direction, and

third means responsive in the vehicle to the first and second signals received by the  
vehicle from the central station for operating the first and second motors at the same speed  
without any progressive increments in speed, for movement of the vehicle in the longitudinal  
direction, when one of the motors has been previously operated at a different  
25 speed than the other motor, the same speed constituting the higher of the speeds provided by the  
first and second motors.

41. In a combination as recited in claim 40,

fourth means responsive in the vehicle to the first and second signals received by the  
vehicle from the central station for converting the first and second signals to pulse width  
modulations in progressive periods of time, the pulse width modulations for each of the first and  
5 second motors at each instant being dependent upon the speed at which such motor is to be  
operated at that instant,

the operation of the second and third means at each instant being dependent upon such  
pulse width modulations at that instant and the duty cycles of such pulse width modulations at  
that instant.

42. In a combination as set forth in claim 40,

fourth means responsive in the vehicle to the failure of the vehicle to receive the first and second signals for a particular period of time for maintaining the same operation of the first and second motors for such particular period of time as the operation of such motors upon the last reception by the vehicle of the first and second signals from the central station.

43. In combination in a vehicle for moving the vehicle in accordance with commands which are provided by a handheld pad to control the movements of the vehicle and which are converted by a central station to commands addressed by the central station to the vehicle to obtain the movements of the vehicle,

a pair of left wheels in the vehicle, the left wheels being spaced from each other in a longitudinal direction,

a pair of right wheels in the vehicle, the right wheels having the same spacing in the longitudinal direction as the left wheels,

a first motor in the vehicle for moving the left wheels in the vehicle in the longitudinal direction,

a second motor in the vehicle for moving the right wheels in the vehicle in the longitudinal direction,

the commands addressed to the vehicle from the central station including first signals for operating the first motor and second signals for operating the second motor,

first means in the vehicle for receiving the commands addressed to the vehicle from the central station,

second means responsive in the vehicle to the first and second signals received by the vehicle from the central station for operating the first and second motors in accordance with such signals, and

third means responsive in the vehicle to the failure of the vehicle to receive the first and second signals for a particular period of time for maintaining the same operation of the first and second motors for such particular period of time as the operation of the motors upon the last reception by the vehicle of the first and second signals from the central station.

44. In a combination as set forth in Exhibit 43,

fourth means responsive in the vehicle to the first and second signals received by the vehicle from the central station for normally accelerating the first and second motors in progressive increments to the speeds commanded by the central station to such motors for movement of the vehicle in the longitudinal direction.

45. In a combination as set first in Exhibit 43,

fourth means responsive in the vehicle to the first and second signals received by the vehicle from the central station for operating the motor in accordance with such first and second signals only when the receiver has received the same first and second signals from the central station a plurality of successive times.

46. In combination,

a plurality of hand held pads,

a plurality of vehicles,

each of the handheld pads providing first binary indications representing a selection of an individual one of the vehicles and second binary indications representing individual operations to be provided by such vehicle,

a central station responsive to the first and second binary indications from the different pads on a cyclic basis for producing for each of the pads first signals providing an individual address for the individual one of the vehicles selected by such pad and second signals providing commands for moving such vehicle in a particular direction and for operating such vehicle,

means responsive in each of the vehicles to the first signals addressing such vehicle from the central station and to the second signals from the central station for such vehicle for moving such vehicle and operating such vehicle in accordance with the commands provided by the central station to such vehicle, and

means operative in each of the vehicles for continuing to provide a movement of such vehicle for a particular period of time in accordance with the last commands addressed to such vehicle by the central station when the vehicle fails to receive any commands addressed to such vehicle during such particular period of time.



47. In a combination as set forth in claim 46,

means in each of the vehicles for providing for an operation of such vehicle in the inactive but powered state at the end of the particular period of time when such vehicle fails to receive any commands addressed to such vehicle during such particular period of time.

48. In a combination as set forth in claim 46,  
means responsive in each of the vehicles to the commands addressed to the vehicle relating to movements of the vehicle for accelerating the vehicle in progressive increments to obtain such movements.

49. In combination,  
a plurality of hand held pads,  
a plurality of vehicles,  
each of the handheld pads providing first binary indications representing a selection of  
5 an individual one of the vehicles and second binary indications representing individual operations to be provided by such vehicle,

a central station responsive to the first and second binary indications from the different pads on a cyclic basis for producing for each of the pads first signals providing an individual address for the individual one of the vehicles selected by such pad,

10 each of the vehicles including a pair of left wheels spaced from each other in a longitudinal direction and a pair of right wheels spaced from each other in the longitudinal direction and including a first motor for moving the left wheels and a second motor for moving the right wheels,

15 the commands addressed to the vehicle from the central station including second signals for operating the first motor and third signals for operating the second motor,

first means in each of the vehicles for receiving the first, second and third signals addressed to such vehicle from the central station,

20 second means responsive in each of the vehicles to the second and third signals received by the vehicle from the central station for normally accelerating the first and second motors in progressive increments to the speeds commanded by the central station to such motors for movement of such vehicle in the longitudinal direction.

50. In a combination as recited in claim 49,  
third means responsive in each of the vehicles to the second and third signals received by such vehicle from the central station for movement of such vehicle in the longitudinal

direction for operating the first and second motors at the same speed, without any progressive  
5 increments in speed, when one of the motors in such vehicle has been previously operated at a  
different speed than the other motor in such vehicle, the same speed constituting the higher of  
the speeds provided by the first and second motors in such vehicle.

51. In a combination as set forth in claim 49,

means operative in each of the vehicles for continuing to operate the first and second  
motors for a particular period of time in accordance with the last ones of the second and third  
signals received by such vehicle from the central station when such vehicle fails to receive the  
5 second and third signals addressed to such vehicle during such particular period of time.

52. In combination,

a plurality of hand held pads,

a plurality of vehicles,

each of the hand held pads providing first binary indications representing a selection of  
5 an individual one of the vehicles and second binary indications representing individual  
operations to be provided by such vehicles,

a central station responsive to the first and second binary indications from the different  
pads on a cyclic basis for producing for each of the pads first signals providing an individual  
address for the individual one of the vehicles selected by such pad and second signals providing  
10 commands for moving such vehicle in a particular direction and for operating such vehicle,

first means in each of the vehicles for receiving the first and second signals from each of  
the pads,

second means responsive in each of the vehicles to the second signals addressed to such  
vehicle for determining whether successive ones of the second signals addressed to such vehicle  
15 on the cyclic basis are identical, and

third means in each of the vehicles for operating such vehicle in accordance with the  
second signals addressed to such vehicle when the second means in such vehicle determines that  
the successive ones of the second signals addressed to such vehicle on the cyclic basis are  
identical.

53. In a combination as set forth in claim 52,

the third means in each of the vehicles being operative to operate such vehicle in accordance with the second signals addressed to such vehicle in the second of the successive ones of the second signals addressed to such vehicle on the cyclic basis when the second means in such vehicle determines that the successive ones of the second signals addressed to such vehicle on the cyclic basis are identical.

54. In a combination as set forth in claim 52,

the first and second signals for each of the vehicles being in the form of packets each having a first particular number of the first signals and a second particular number of the second signals,

fourth means for determining whether at least a particular percentage of the packets addressed to each of the vehicles has the first particular number of the first signals and the second particular number of the second signals in such packets during a particular period of time, and

fifth means for operating each of the vehicles in accordance with the second signals in the packets addressed to such vehicle when the fourth means in such vehicle determines that at least the particular percentage of the packets addressed to such vehicle has the first particular number of the first signals and the second particular number of the second signals in the packets during the particular period of time.

55. In combination,

a plurality of hand held pads,

a plurality of vehicles,

each of the hand held pads providing first binary indications representing a selection of an individual one of the vehicles and second binary indications representing individual operations to be provided by such vehicles,

a central station responsive to the first and second binary indications from the different pads on a cyclic basis for producing for each of the pads on the cyclic basis first signals providing an individual address for the individual one of the vehicles selected by such pad and

10 second signals providing commands for moving such vehicle in a particular direction and for operating such vehicle,

first means in each of the vehicles for receiving the first and second signals from each of the pads,

the first and second signals for each of the vehicles being in the form of packets each  
15 having a first particular number of the first signals and a second particular member of the second signals,

second means for determining whether at least a particular percentage of the packets addressed to each of the vehicles has the first particular number of the second signals in each packet during a particular period of time, and

20 third means for operating each of the vehicles in accordance with the second signals in the packets addressed to such vehicle when the fourth means in each vehicle determines that at least the particular percentage of the packets addressed to such vehicle has the second particular number of the second signals in the packets during the particular period of time.

56. In a combination as set forth in claim 55,

the central station being operative to interrogate each of the pads on the cyclic basis to determine the first and second binary indications from such pads, and

5 means in the central station for sending to the vehicles at each instant only the second binary indications representing changes in the commands from the pads at that instant.

57. In combination in a vehicle for use in a central station operative to receive, from a plurality of pads on a cyclic basis, first binary indications representing the address of the vehicle and second binary indications representing operations to be performed by the vehicle and operative to send first signals in accordance with the first binary indications and second signals  
5 in accordance with the second binary indications,

first means in the vehicle for receiving the first and second signals from the central station on the cyclic basis for each of the pads,

second means in the vehicle for determining whether successive ones of the second signals addressed to such vehicle on the cyclic basis are identical, and

10        third means in each of the vehicles for operating such vehicle in accordance with the second signals addressed to such vehicle when the second means in such vehicle determines that the successive ones of the second signals addressed to such vehicle on the cyclic basis are identical.

58. In a combination as set forth in claim 57 wherein

the third means in each of the vehicles is operative to operate such vehicle in accordance with the successive ones of the second signals addressed to such vehicle on the cyclic basis when the second means in such vehicle determines that the successive ones of the second signals  
5        addressed to such vehicle on the cyclic basis are identical.

59. In a combination as set forth in claim 58, including,

fourth means responsive to first ones of the second signals addressed to such vehicle on the cyclic basis for moving the vehicle, and

fifth means responsive to second ones of the second signals addressed to such vehicle on  
5        the cyclic basis for providing operations of the vehicle other than moving the vehicle.

60. In a combination as set forth in claim 59,

the first and second signals for the vehicle being in the form of packets each having a first particular number of the first signals and a second particular number of the second signals,

sixth means for determining whether at least a particular percentage of the packets  
5        addressed to the vehicle has the second particular number of the second signals in such packets during a particular period of time, and

seventh means for operating the vehicle in accordance with the second signals in the packets addressed to such vehicle when the sixth means in such vehicle determines that at least the particular percentage of the packets addressed to such vehicle has at least the second  
10        particular number of the second signals in the packet, during the particular period of time.

61. In combination in a vehicle for use with a central station operative to receive, from a plurality of pads on a cyclic basis, first binary indications representing the address of the vehicle and second binary indications representing operations to be performed by the vehicle and for sending first signals in accordance with the first binary indications and second signals in accordance with the second binary indications,

first means in the vehicle for receiving the first and second signals from the central station in representation of the binary indication from each of the pads,

the first and second signals for the vehicle being in the form of packets each having a first particular number of the first signals and a second particular number of the second signals,

second means in the vehicle for determining whether at least a particular percentage of the packets addressed to the vehicle has the second particular number of the second signals in such packets during a particular period of time, and

third means in the vehicle for operating the vehicle in accordance with the second signals in the packets addressed to such vehicle when the second means in such vehicle determines that at least the particular percentage of the packets addressed to such vehicle has the second particular number of the second signals in the packets during the particular period of time.

62. In a combination as set forth in claim 61,

the vehicle including wheels and motors for rotating the wheels and including at least one member movable on the vehicle to perform selective functions,

the third means being responsive in the vehicle to the second signals for rotating the wheels in the vehicle to obtain a movement of the vehicle in accordance with such wheel rotations and for moving the member to perform the selective functions.

63. In combination for use in a system including a central station and a plurality of vehicles and a plurality of pads each manually operable to provide first binary indications providing an address to an individual one of the vehicles and second binary indications providing commands for operating the individual one of the vehicles and each operable to provide the first and second binary indications to the central station for the transmission by the central station to the vehicles of the first and second binary indications from each of the pads,

a microcontroller in the central station,

a first line extending between the microcontroller and the pads in the plurality to provide an interrogation of such pads of the first and second binary indications from such pads,

10 a second plurality of lines each extending between the microcontroller and an individual one of the pads for providing clock signals to the individual one of the pads for controlling the time of the interrogation of such individual one of the pads by the central station, and

15 a plurality of third lines each extending between the microcontroller and an individual one of the pads for providing the first and second binary indications from the individual one of the pads to the central station in response to the interrogation by the central station to the individual one of the pads.

64. In a combination as set forth in claim 63,

the second lines introducing the clock signals in sequence to the different ones of the pads on a cyclic basis to obtain an interrogation of the pads by the central station when the pads receive the clock signals, and

5 the third lines providing the first and second binary indications from the pads to the central station when the pads are interrogated by the central station.

65. In a combination as set forth in claim 63,

the second lines introducing the clock signals simultaneously to the different ones of the pads to obtain a simultaneous interrogation of the different pads by the central station, and

5 the third lines providing the first and second binary indications from the pads when the pads are interrogated by the central station.

66. In a combination as set forth in claim 63,

the clock signals having first and second polarities,

the interrogation of the pads in the plurality by the central station occurring when the clock signals on the second lines have a particular one of the first and second polarities.



67. In combination for use in a system including a central station and a plurality of vehicles and a plurality of pads each manually operable to provide first binary indications providing an address to an individual one of the vehicles and second binary indications providing commands for operating the individual one of the vehicles and each operable to provide the first and second binary indications to the central station for the transmission by the central station to the vehicles of the first and second binary indications from each of the pads,

a first line extending between the central station and the pads in the plurality to provide an interrogation of such pads of the first and second binary indications from such pads,

a second plurality of lines each extending between the central station and an individual one of the pads for providing clock signals to the individual one of the pads for controlling the time of the interrogation of such individual one of the pads by the central station, and

a plurality of third lines each extending between the central station and an individual one of the pads for providing the first and second binary indications from the individual one of the pads to the central station in response to the interrogation by the central station to the individual one of the pads,

the third lines also providing binary indications from the central station to each individual one of the pads in the plurality, after the provision of the first and second binary indications from such individual one of the pads to the central station, of the particular one of the vehicles addressed by each individual one of the pads.

68. In a combination as set forth in claim 67,

the second lines introducing the clock signals in sequence to the different ones of the pads on a cyclic basis to obtain an interrogation of the pads by the central station when the pads receive the clock signals, and

the third lines providing the first and second binary indications from the pads to the central station when the pads are interrogated by the central station,

each of the pads having a plurality of lights each indicating a different one of the vehicles, and

means for illuminating a particular one of the lights on each of the pads in accordance with the particular one of the vehicles addressed by such pad.

69. In a combination as set forth in claim 67,

the second lines introducing the clock signals simultaneously to the different ones of the pads to obtain a simultaneous interrogation of the different pads by the central station, and

the third lines providing the first and second binary indications from the pads when the pads are interrogated by the central station,

each of the pads having a plurality of lights each indicating a different one of the vehicles, and

means for illuminating a particular one of the lights on each of the pads in accordance with the particular one of the vehicles addressed by such pad.

70. In a combination as set forth in claim 63,

the clock signals having first and second polarities,

the interrogation of the pads in the plurality by the central station occurring when the clock signals on the second lines have a particular one of the first and second polarities,

the illumination of the particular one of the lights on each of the pads by the indications from the central station to such pad through the third line for such pad in representation of the particular one of the vehicles addressed by such pad occurring when the clock signals on the second lines have the other one of the first and second polarities.

71. In combination for use in a system including a central station and a plurality of vehicles and a plurality of pads each manually operable to provide first binary indications providing an address to an individual one of the vehicles and second binary indications providing commands for operating the individual one of the vehicles and each operable to provide the first and second binary indications to the central station for the transmission by the central station to the vehicles of the first and second binary indications from each of the pads,

a first line extending between the central station and the pads in the plurality to provide an interrogation of such pads of the first and second binary indications from such pads,

10 a plurality of second lines each extending between the central station and an individual one of the pads for providing clock signals to the individual one of the pads for controlling the time of interrogation of the individual one of the pads by the central station, and

a plurality of third lines each providing an indication from the central station to the individual one of the pads of the vehicle addressed by such individual one of the pads.

72. In a combination as set forth in claim 71,

the clock signals having first and second polarities,

5 each of the third lines providing the first and second binary indications in an individual one of the pads to the central station in the first polarity of the clock signals and each providing an indication from the central station to the individual one of the pads, in the second polarity of the clock signals, of the vehicle addressed by such individual one of the pads.

73. In a combination as set forth in claim 72,

the second lines introducing the clock signals in sequence to the different ones of the pads on a cyclic basis to obtain an interrogation of the pads by the central station when the pads receive the clock signals, and

5 the third lines providing the first and second binary indications from the pads to the central station when the pads are interrogated by the central station.

74. In a combination as set forth in claim 73,

a plurality of lights in each of the pads, each of such lights providing an indication, when illuminated, of an individual one of the vehicles, and

5 means for illuminating an individual one of the lights in each of the pads in accordance with the indication from the central station to such pad of the vehicle addressed by such pad.

75. In a combination as set forth in claim 72,

the second lines introducing the clock signals simultaneously to the different ones of the pads to obtain a simultaneous interrogation of the different pads by the central station, and

the third lines providing the first and second binary indications from the pads when the  
5 pads are interrogated by the central station.

76. In combination for use in a system including a central station and a plurality of  
vehicles and a plurality of pads each manually operable to provide first binary indications  
providing an address to an individual one of the vehicles and second binary indications providing  
commands for operating the individual one of the vehicles and each operable to provide the first  
5 and second binary indications to the central station for the transmission by the central station to  
the vehicles of the first and second binary indications from each of the pads,

a first line extending between the central station and the pads in the plurality to provide  
an interrogation of such pads of the first and second binary indications from such pads,

10 a plurality of second lines each extending between the central station and an individual  
one of the pads for providing clock signals to the individual one of the pads for controlling the  
time of the interrogation of such individual one of the pads by the central station, and

15 a plurality of third lines each extending between the central station and an individual one  
of the pads for providing the first and second binary indications from the individual one of the  
pads to the central station in response to the interrogation by the central station to the individual  
one of the pads,

the extension of the third lines between the central station and the pads providing for the  
decoupling of any one of the pads from the central station without affecting the provision of the  
first and second binary indications from the other one of the pads to the central station.

77. In a combination as set forth in claim 76,

each of the third lines providing an indication from the central station to the individual  
one of the pads of the vehicle addressed by such individual one of the pads,

5 the extension of the third lines between the central station and the pads providing for the  
decoupling of any one of the pads from the central station without affecting the provision of the  
indications from the central station to the other pads of the vehicles addressed by such other ones  
of the pads.

78. In a combination as set forth in claim 76,

the extensions of the third lines between the central station and the pads providing for the extensions of additional third lines between additional pads and the central station to provide first and second binary indications from each of such additional pads to the central station in response to interrogations by the central station to the individual ones of such additional pads without affecting the provision of the first and second binary indications from the pads in the plurality to the central station.

79. In a combination as set forth in claim 77,

the extensions of the third lines between the central station and the pads providing for the extensions of additional third lines between additional pads and the central station to provide first and second binary indications from each of such additional pads to the central station in response to interrogations by the central station to the individual ones of such additional pads without affecting the provision of the first and second binary indications from the pads in the plurality to the central station and without affecting the provision of the indications from the central station to the pads in the plurality of the vehicles addressed by such pads in the plurality.

80. In combination for use in a system including a central station and a plurality of vehicles and a plurality of pads each manually operable to provide first binary indications providing an address to an individual one of the vehicles and second binary indications providing commands for operating the individual one of the vehicles and each operable to provide the first and second binary indications to the central station for the transmission by the central station to the vehicles of the first and second binary indications from each of the pads,

a first line extending between the central station and the pads in the plurality to provide an interrogation of such pads of the first and second binary indications from such pads,

a plurality of second lines each extending between the central station and an individual one of the pads for providing clock signals to the individual one of the pads for controlling the time of the interrogation of such individual one of the pads by the central station, and

a plurality of third lines each extending between the central station and an individual one of the pads for providing the first and second binary indications from the individual one of the

pads to the central station in response to the interrogation by the central station to the individual  
15 one of the pads,

the extensions of the third lines between the central station and the pads providing for the  
extensions of additional third lines between additional pads and the central station to provide first  
and second binary indications from each of such additional pads to the central station in response  
to interrogations by the central station to the individual ones of such additional pads without  
20 affecting the provision of the first and second binary indications from the pads in the plurality  
to the central station.

81. In a combination as set forth in claim 80,

the extensions of the third lines between the central station and the pads providing for the  
extensions of additional third lines between additional pads and the central station to provide first  
and second binary indications from each of such additional pads to the central station in response  
5 to interrogations by the central station to the individual ones of such additional pads without  
affecting the provision of the first and second binary indications from the pads in the plurality  
to the central station, and without affecting the provision of the indications from the central  
station to the pads in the plurality of the vehicles addressed by such pads in the plurality.

82. In combination for use in a system including a central station and a plurality of  
vehicles and a pad manually operable to provide first binary indications providing an address to  
an individual one of the vehicles and second binary indications providing commands for  
operating the individual one of the vehicles and operable to provide the first and second  
5 indications to the central station for the transmission by the central station to the vehicles of the  
first and second binary indications from the pad,

a first line extending between the central station and the pad to provide an interrogation  
of such pad of the first and second binary indications in such pad,

a second line extending between the central station and the pad for providing clock  
10 signals to the individual one of the pads for controlling the time of the interrogation of such pad  
by the central station,

a third line extending between the central station and the pad for providing the first and second binary indications from the pad to the central station in response to the interrogation by the central station to the pad,

15 first means for storing the first and second binary indications in the pad, and

second means associated with the second and third lines for providing a transfer of the binary indications in the first means to the third line when an interrogation of such pad is provided on the first line.

83. In a combination as set forth in claim 79 wherein  
the first means stores the first and second binary indications in a parallel form and  
the second means transfers the binary indications in the first means to the third means in  
a serial form.

84. In a combination as set forth in claim 82 wherein  
the first line provides a first voltage on the first line to provide an interrogation of the first  
and second binary indications in such pad and wherein

5 the central station provides through the first line to the pad signals identifying the vehicle  
selected by the pad and wherein

the central station provides such identifying signals to the pad during the time that a  
second voltage different from the first voltage is on the first line.

85. In a combination as set forth in claim 84,  
the pad providing a plurality of lights each indicating, when illuminated, the addressing  
of such vehicle by the pad and wherein  
means are provided for illuminating a particular one of the lights in accordance with the  
5 signals passing through the third line from the central station to the pad.

86. In combination for use in a system including a central station and a plurality of  
vehicles and a pad manually operable to provide first binary indications providing an address to  
an individual one of the vehicles and second binary indications providing commands for  
operating the individual one of the vehicles and operable to provide the first and second binary  
5 indications to the central station for the transmission by the central station to the vehicles of the  
first and second binary indications from the pad,

a first line extending between the central station and the pad and having a first voltage  
at first particular times and having a second voltage at second particular times different from the  
first particular times,

10 a second line extending between the central station and the pad to provide a transfer of  
information between the central station and the pad,

first means for interrogating the pad to determine the pattern of the first and second  
binary indications in the pad when the first line has the first voltage,

15 second means operative during the production of the first voltage on the first line for  
passing the first and second binary indications in the pad to the central station for the  
transmission of such first and second binary indications by the central station to the pad, and

third means operative during the production of the second voltage on the first line for  
transmitting to the pad through the second line from the central station signals identifying an  
individual one of the vehicles addressed by the first binary indications from the pad.

87. In a combination as set forth in claim 86,  
there being in the pad a plurality of lights each indicating, when illuminated, an  
individual one of the vehicles addressed by the pad, and



means responsive to the signals passing through the second line from the central station  
5 to the pad during the production of the second voltage on the first line for illuminating the light  
identifying the individual one of the vehicles addressed by the first binary indications from the  
pad.

88. In combination for use with a plurality of vehicles each having an individual address  
and each operable when receiving the individual address,

a central station,

a plurality of pads each manually operable to address an individual one of the vehicles  
5 and each providing commands to operate the individual one the vehicles,

each of the pads being connected to the central station for receiving power from the  
central station to provide first binary indications addressing the individual one of the vehicles and  
second binary indications providing commands for operating the vehicles,

first means in the central station for interrogating each of the pads, separately from the  
10 interrogations of the other pads, to determine the first and second binary indications from the  
pads,

second means in the pads for transmitting the first and second binary indications from the  
pads to the central station upon the interrogation of the pads by the central station,

third means in the central station for transmitting to the vehicles the first and second  
15 binary indications determined from each of the pads,

the central station and the pads being constructed to provide for a disconnection of any  
particular one of the pads from the central station,

the first means being operative to interrogate the other pads upon the disconnection of  
the particular one of the pads from the central station,

20 the second means in the pads being operative to transmit the first and second binary  
indications from the other pads to the central station upon the disconnection of the particular one  
of the pads from the central station,

the third means in the central station being operative to transmit the first and second  
binary indications from the other pads to the vehicles upon the disconnection of the particular  
25 one of the pads from the central station, and

fourth means responsive in the central station to the disconnection of the particular one of the pads from the central station for freeing the vehicle addressed by the particular one of the pads to receive from the central station first binary indications provided by any particular one of the other pads and representing the address of such vehicle and second binary indications provided by such particular one of the other pads and representing commands to such vehicle and to be operated in accordance with such second binary indications.

89. In a combination as set forth in claim 88,

the first means being operative to interrogate the pads in the plurality on a cyclic basis before the disconnection of the particular one of the pads from the central station and to interrogate the pads in the plurality, other than the particular one of the pads, on the cyclic basis after the disconnection of the particular one of the pads from the central station.

90. In a combination as set forth in claim 88,

the first means being operative to interrogate the pads in the plurality simultaneously before the disconnection of the particular one of the pads from the central station and to interrogate the pads in the plurality, other than the particular one of the pads, simultaneously after the disconnection of the particular one of the pads from the central station.

91. In a combination as set forth in claim 88,

fifth means in each of the pads for providing for an illuminated indication in such pad of the individual one of the vehicles addressed by such pad, and

sixth means in each of the pads for providing in such pad an illumination indicating the individual one of the vehicles addressed by such pad, and

seventh means in the central station for discontinuing the illumination of the individual one of the vehicles addressed by the particular one of the pads when the particular one of the pads is disconnected from the central station.

92. In combination for use with a plurality of vehicles each having an individual address and each operable when receiving the individual address,

a central station,

a plurality of pads each manually operable to address an individual one of the vehicles  
5 and each providing commands to operate the individual one of the vehicles,

each of the pads being connected to the central station for receiving power from the  
central station to provide first binary indications addressing the individual one of the vehicles and  
second binary indications providing commands for operating the individual one of the vehicles,

10 first means in the central station for interrogating each of the pads, separately from the  
interrogations of the other pads, to determine the first and second binary indications from such  
pad,

second means in the pads for transmitting the first and second binary indications from the  
pads to the central station upon the interrogation of the pads by the central station,

15 third means in the central station for transmitting to the vehicles the first and second  
binary indications determined from each of the pads,

the central station and the pads being constructed to provide for the connection of an  
additional pad to the central station,

the first means in the central station being operative to interrogate the pads in the plurality  
and the additional pad upon the connection of the additional pad to the central station,

20 the second means in the pads being operative to transmit the first and second binary  
indications from the pads in the plurality and the additional pad to the central station upon the  
connection of the additional pad to the central station, and

the third means in the central station being operative to transmit the first and second  
binary indications from the pads in the plurality and the additional pad to the vehicles in the  
25 plurality upon the connection of the additional pad to the central station.

93. In a combination as set forth in claim 92,

the first means being operative to interrogate the pads in the plurality on a cyclic basis  
before the connection of the additional pad to the central station and to interrogate the pads in  
the plurality and the additional pad on the cyclic basis after the connection of the additional pad  
5 to the central station.

94. In a combination as set forth in claim 92,  
the first means being operative to interrogate the pads in the plurality simultaneously  
before the connection of the additional pad to the central station and to interrogate the pads in  
the plurality and the additional pad  
5 simultaneously after the connection of the additional pad to the central station.

95. In a combination as set forth in claim 92,  
fourth means in each of the pads for providing for an illuminated indication in such pad  
of the individual one of the vehicles addressed by such pad,  
fifth means in the central station for providing in such pad an illumination indicating the  
5 individual one of the vehicles addressed by such pad,  
the fifth means in the central station being operative to continue the illumination of the  
vehicles addressed by the pads in the plurality and to provide an illumination of the vehicle  
addressed by the additional pad when the additional pad is connected to the central station.

96. In a combination as set forth in claim 1,  
the pads in the plurality being connected to the central station, and  
means in the central station for discontinuing the operation of the vehicle by the  
individual one of the pads when the additional one of the pads is disconnected from the central  
5 station.

97. In a combination as set forth in claim 5,  
the pads in the plurality being connected to the central station, and  
means in the central station for providing for the operation of the vehicle by the  
individual one of the pads when the second one of the pads is disconnected from the central  
5 station.

98. In a combination as set forth in claim 66,  
the central station providing indications, through the third line for each of the pads, to  
such pad of the individual one of the vehicles selected by such pad, and

means in each of the pads for indicating the individual one of the vehicles selected by  
5 such pad in accordance with the indications provided by the central station to such pad through  
the third line for such pad.

99. In a combination as set forth in claim 75,  
a plurality of lights in each of the pads, each of such lights providing an indication, when  
illuminated, of an individual one of the vehicles, and

means for illuminating an individual one of the lights in each of the pads in accordance  
5 with the indication from the central station to such pad of the vehicle addressed by such pad.

100. In combination for use with a plurality of vehicles,  
a plurality of pads each operative to provide a first plurality of binary indications  
addressing an individual one of the vehicles and to provide a second plurality of binary  
indications providing commands to such individual one of the vehicles for operating such  
5 vehicle,

a central station,

first means in the central station for interrogating the pads to determine the first and  
second binary indications from such pads,

second means in the pads for transmitting the first and second binary indications from the  
10 pads to the central station, and

third means responsive in the central station to the identities of the first binary indications  
in successive transmissions of the first and second binary indications from each individual one  
of the pads to the central station for transmitting the first and second binary indications for such  
pad to the vehicles in the plurality.

101. In a combination as set forth in claim 100,

means in the central station for transmitting at each instant only the second binary  
indications from the pads which are providing changes in commands at that instant.

102. In a combination as set forth in claim 100,

the first means in the central station being operative to interrogate the pads on a cyclic basis to obtain the binary indications from each of the pads, on the cyclic basis with the other pads, of the individual one of the vehicles addressed by such pad and the binary indications for providing commands for operating the individual one of the vehicles.

103. In a combination as set forth in claim 100,

the first means in the central station being operative to simultaneously interrogate the pads to obtain simultaneously from the pads the first binary indications the individual ones of the vehicles and the second binary indications providing the commands for operating the individual ones of the vehicles.

104. In combination for operating a vehicle in accordance with addresses and commands provided by a pair of handheld pads and transmitted by a central station to the vehicle,

first means in the vehicle for receiving the addresses and commands provided by the pads and transmitted by the central station,

second means in the vehicle for identifying the received addresses as those of the vehicle,

third means responsive in the central station to the identification of the addresses received from the pads as those of the vehicle for providing for an execution of the received commands by the vehicle in accordance with such commands when the identified commands are complementary, and

fourth means responsive in the central station to the identification of the addresses received from the pads as those of the vehicle for providing for an execution by the vehicle of commands different from the commands provided by the pads when the commands are contradictory.

105. In a combination as set forth in claim 104,

fifth means responsive in the vehicle to the discontinuance of one of the pads in the plurality in addressing the vehicle for continuing the response of the vehicle to the addresses and commands from the other one of the pads in the pair.

106. In a combination as set forth in claim 23,

the first means being operative to interrogate the pads in the plurality and an additional pad on a cyclic basis,

the second means being responsive on the cyclic basis to the interrogation provided by the first means of the pads in the plurality and the additional pad sending the addresses and commands to the addressed vehicles to obtain an operation of such vehicles in accordance with such commands.

107. In a combination as provided in claim 26,

the first means being operative to interrogate the pads on a cyclic basis.

108. In combination for use in a system including a plurality of vehicles each responsive to an individual address and to a plurality of commands for providing individual operations of vehicles in accordance with such commands,

a plurality of pads each operative to provide an address for selecting an individual one of the vehicles and to provide commands to such individual one of the vehicles for operating such individual one of the vehicles in accordance with such commands,

a central station connected to the pads,

first means in the central station for interrogating the pads on a cyclic basis to determine the address and the commands provided by such pads,

second means responsive in the central station to the interrogation provided by the first means in the central station concerning the address and the commands from such pad for receiving the address and the commands from such pad and for transmitting the address and the commands from such pad to the vehicles in the plurality, and

third means responsive in the central station to any change in the address or commands  
15 from an individual one of the pads for transmitting the address and the commands from such pad  
to the vehicles in the plurality on a priority basis.

109. In a combination as set forth in claim 108 wherein  
the central station discontinues the interrogation of any pad which is disconnected from  
the central station.

110. In a combination as set forth in claim 108 wherein  
the central station transmits the address and commands from the individual one of the  
pads in the plurality to the vehicles in the plurality only when the central station has completed  
the transmission to the vehicles in the plurality of the address and commands of the pad whose  
5 address and commands the central station has been transmitting at the time that the central station  
receives the change in the address and the commands from the individual one of the pads in the  
plurality.

111. In combination for use in a system including a plurality of vehicles each responsive  
to an individual address and to a plurality of commands for providing individual operations of  
vehicles in accordance with such commands,

a plurality of pads each operative to provide an address for selecting an individual one  
5 of the vehicles and to provide commands to such individual one of the vehicles for operating  
such individual one of the vehicles in accordance with such commands,

a central station connected to the pads,

first means in the central station for interrogating the pads on a cyclic basis to determine  
the address and the commands provided by such pads,

10 second means responsive in the central station to the interrogation provided by the first  
means in the central station concerning the address and the commands from such pads for  
receiving the address and the commands from such pads and for transmitting the address and the  
commands from such pads to the vehicles in the plurality, and



15        third means responsive in the central station to the coupling of an individual one of the pads to the central station and to the reception by such central station of an address and commands from such individual one of the pads for transmitting such address and commands from such individual one of the pads on a priority basis.

112. In a combination as set forth in claim 111 wherein  
the central station for transmitting to the vehicles at each instant only the commands from the pads which are providing changes in commands at that instant.

113. In a combination as set forth in claim 111 wherein  
the central station transmits the address and commands from the individual one of the stations in the plurality to the vehicles in the plurality only when the central station has completed the transmission to the vehicles in the plurality of the address and commands of the  
5        pad whose address and commands the central station has been transmitting at the time that the central station receives the address and the commands from the individual one of the pads in the plurality.

114. In combination for use in a system including a plurality of vehicles each responsive in a first relationship to an individual address and to a plurality of commands for providing operations of such individual one of the vehicles in accordance with such commands, the system including, in a second relationship, at least one auxiliary accessory for receiving commands,  
5        a plurality of pads each operative to provide an address for selecting an individual one of the vehicles and to provide commands to such individual one of the vehicles for operating such individual one of the vehicles in accordance with such commands and each operative to provide an additional command indicating whether or not the individual one of the vehicles or the auxiliary accessory is to be operated,

10        a central station connected to the pads,

first means in the central station for interrogating the pads to determine the address and the commands and the additional command provided by such pads,

second means in the central station for receiving the address and the commands and the additional command from each of the pads,

15        a smart port in the central station for receiving commands intended by the pads to be directed to the auxiliary accessory,

third means responsive in the central station to the additional command from the pads for determining from the additional command whether or not the commands from the pads are intended for the vehicles or for the auxiliary accessory,

20        fourth means in the central station for directing the commands from the pads to the smart port when the central station determines from the additional command that the commands are intended by the pads for the additional accessory, and

25        fifth means in the central station for processing the address and commands in a first relationship to provide a first pattern of binary indications when the central station determines from the additional command from the pads that the commands from the pads are not to be directed to the smart port and for processing the commands in a second relationship different from the first relationship to provide a second pattern of binary indications when the central station determines from the additional command from the pads that the commands are to be directed to the smart port, and

30        sixth means in the central station for transmitting the first and second patterns of the binary indications.

115. In a combination as set forth in claim 114,

a first microcontroller,

a second microcontroller,

5        the fifth means including the first microcontroller for processing the address and the commands in the first relationship to provide the first pattern of binary indications when the central station determines from the additional command from the pads that the commands from the pads are not to be directed to the smart port,

the fifth means including the second microcontroller for providing the commands in the second relationship to provide the second pattern of the binary indications when the central

10 station determines from the additional command from the pads that the commands are to be directed to the smart port.

116. In combination,

a plurality of vehicles,

an auxiliary accessory different from the vehicles,

5 a pad operative to provide an address for selecting an individual one of the vehicles and to provide commands to such individual one of the vehicles for operating such individual one of the vehicles in accordance with such commands and to provide an additional command indicating whether or not such individual one of the vehicles is to be operated or the auxiliary accessory is to be operated,

a central station connected to the pad,

10 first means in the central station for receiving the address and the commands and the additional command from the pad,

a smart port in the central station for receiving the commands intended to be directed to the auxiliary accessory,

15 second means responsive in the central station to the additional command from the pad for determining from such additional command whether or not the commands from the pad are intended for the vehicle or for the auxiliary accessory,

third means in the central station for directing the commands from the pad to the smart port when the central station determines from the additional command that the commands are intended for the additional accessory,

20 fourth means in the central station for processing the address and commands in a first relationship to provide a first pattern of binary indications when the central station determines from the additional command in the pad that the commands from the pad are not to be directed to the smart port and for processing the commands in a second relationship different from the first relationship to provide a second pattern of binary indications when the central station  
25 determines from the additional command in the pad that the commands are to be directed to the smart port,

fifth means in the central station for transmitting the first and second patterns of the binary indications to the vehicle and the auxiliary accessory,

sixth means in the individual one of the vehicles for operating the vehicle in accordance with the first pattern of the binary indications, and

seventh means in the auxiliary accessory for operating the auxiliary accessory in accordance with the second pattern of the binary indications.

117. In a combination as set forth in claim 116,

a first microcontroller,

a second microcontroller,

the fourth means including the first microcontroller for processing the address and the commands in the first relationship to provide the first pattern of binary indications when the central station determines that the commands from the pads are not to be directed to the smart port,

the fourth means including the second microcontroller for providing the commands in the second relationship to provide the second pattern of the binary indications when the central station determines that the commands are to be directed to the smart port.

118. In a combination as set forth in claim 116 wherein

the central station is a first central station and the plurality of pads constitute a first plurality and the plurality of vehicles constitute a first plurality and wherein

the auxiliary accessory is a second central station and wherein a second plurality of pads and a second plurality of vehicles are associated with the second central station and wherein the binary indications in the second pattern direct the second central station to be a slave to the first central station.

119. In combination for use in a system including a plurality of vehicles each responsive, in a first relationship, to an individual address and to a plurality of commands for providing operations of such individual one of the vehicles in accordance with such commands, the system including, in a second relationship, at least one auxiliary accessory for receiving commands,

5 a plurality of pads each operative to provide an address for selecting an individual one of the vehicles and each operative to provide a plurality of commands for operating such individual one of the vehicles in accordance with such commands,

a central station connected to the pads,

a smart port constructed to be connected to the central station,

10 first means in the central station for interrogating the pads to determine if the smart port is connected to the central station,

second means in the central station for passing the commands from the pads through the smart port when the central station determines that the smart port is connected to the central station,

15 third means associated with the central station for processing the commands from the pads in a particular relationship, when the central station determines that the smart port is connected to the central station, to provide commands for operating the auxiliary accessory, and

fourth means in the central station for transmitting the commands in the particular relationship when the smart port is connected to the central station.

120. In a combination as set forth in claim 119,

the particular relationship constituting a first particular relationship,

means in the central station for processing the commands from the pads in a second particular relationship different from the first particular relationships, when the central station  
5 determines that the smart port is not connected to the central station, to provide commands for operating the individual one of the vehicles,

the fourth means in the central station being operative to transmit the commands in the second particular relationship when the smart port is not connected to the central station.

121. In a combination as set forth in claim 120 wherein

the central station is a first central station and the plurality of the pads constitute a first plurality and the plurality of the vehicles constitute a first plurality and wherein the auxiliary accessory is a second central station and wherein a second plurality of pads and a second  
5 plurality of vehicles are associated with the second central station and wherein the binary

indications in the first particular pattern direct the second central station to be a slave to the first central station.

122. In combination for use in a system including a plurality of vehicles each responsive to an individual address and to a plurality of commands for providing individual operations of the vehicles in accordance with such commands,

5 a plurality of pads each operative to provide an address for selecting an individual one of the vehicles and to provide commands to such individual one of the vehicles for operating such individual one of the vehicles in accordance with such commands,

a central station connected to the pads,

first means in the central station for interrogating the pads to determine the address and the commands provided by such pads,

10 second means responsive in the pads to the interrogation by the central station for transmitting the address and the commands from the pads to the central station,

third means in the central station for receiving the addresses and the commands transmitted by the pads, and

15 fourth means in the central station for transmitting to the vehicles in the plurality only the commands transmitted from each pad to the central station that are different from the immediately preceding commands transmitted from such pad to the central station.

123. In a combination as set forth in the claim 122,

the first means in the central station being operative to interrogate the pads on a cyclic basis and the pads being operative to transmit the address and the commands from such pads to the central station when interrogated.

124. In combination for use in a system including a plurality of vehicles each responsive to an individual address and to a plurality of commands for providing individual operations of the vehicles in accordance with such commands,

a plurality of pads each operative to provide an address for selecting an individual one  
5 of the vehicles and to provide commands to such individual one of the vehicles for operating  
such individual one of the vehicles in accordance with such commands,

a central station connected to the pads,

a plurality of first switches each included in an individual one of the pads and having first  
and second modes, of operation and operative in the first mode a successive number of times to  
10 address an individual one of the vehicles,

each of the pads including a plurality of lights each indicating an individual one of the  
vehicles when illuminated,

first means in the central station for remembering at each instant the individual ones of  
the vehicles being addressed by the pads at that instant,

15 a plurality of second switches each having first and second operative relationships and  
each disposed in an individual one of the pads and each operative in the first relationship to  
provide for the selection of only one of the vehicles by such individual one of the pads and  
operative in the second relationship to provide for the address by any other one of the pads of the  
same vehicle addressed by such individual one of the pads,

20 second means responsive in each of the pads to the operation of the first means in the  
central station and to the operation of the second switch in such pad in the first relationship for  
skipping over the lights representing in such pad the vehicles being addressed by the pads when  
the first switch in such pad receives successive actuations to the first mode of operation, and

third means responsive, in the other one of the pads to the operation of the first means in  
25 the central station and to the operation of the second switch in the individual one of the pads in  
the second relationship, for including in the sequence of lights in such other one of the pads the  
light in the vehicle addressed by such individual one of the pads in the second mode of operation  
of the second switch in such individual one of the pads.

125. In a combination as set forth in claim 124,

means in the central station for transmitting the address and commands from the  
individual one of the pads and such other one of the pads to the vehicle addressed by such

individual one of the pads when the second switch in such individual one of the pads is in the  
5 second mode of operation.

126. In combination,

a plurality of vehicles each having an individual address,

a plurality of pads each operative to provide an address for selecting an individual one  
of the vehicles and to provide commands to such individual one of the vehicles for operating  
5 such individual one of the vehicles in accordance with such commands,

a central station connected to the pads,

each of the pads being operative to transmit the address and the commands from such pad  
to the central station for transmission by the central station to the vehicles,

each individual one of the vehicles having a light for illumination when such vehicle is  
10 addressed and commanded by the central station as a result of the address and commands from  
an individual one of the pads,

first means in the central station for storing the addressing by each individual one of the  
pads of the individual one of the vehicles,

second means in the central station for communicating to the individual one of the  
15 vehicles to extinguish the light in such vehicle when the individual one of the pads providing the  
address and the commands to such individual one of the vehicles becomes disconnected from the  
central station, and

third means in each individual one of the vehicles for extinguishing the light in such  
individual one of the vehicles in accordance with the communication from the central station.

127. In a combination as set forth in claim 126,

fourth means in the central station for eliminating the storage of the addressing by each  
individual one of the pads of the individual one of the vehicles when such individual one of the  
pads becomes disconnected from the central station.

128. In a combination as set forth in claim 127,



fifth means in the central station for interrogating on a cyclic basis the pads connected to the central station to determine the address and the commands from such pad to the vehicles,

sixth means for receiving the address and the commands from each of the pads upon the interrogation of such pad by the central station, and

seventh means in the central station for eliminating one of the pads from the cyclic interrogation when such pad becomes disconnected from the central station.

129. In combination for use in a system including a plurality of vehicles each responsive in a first relationship to an individual address and to a plurality of commands for providing operations of such individual one of the vehicles in accordance with such commands, the system including, in a second relationship, at least one auxiliary mechanism for receiving commands,

a central station,

a port in the central station, the port being either a smart port or a dumb port, the port being connectible to the auxiliary accessory,

first means in the central station for determining whether the port is a smart port or a dumb port,

a plurality of pads each operative to provide an address for selecting an individual one of the vehicles and to provide commands to such individual one of the vehicles for operating such individual one of the vehicles in accordance with such commands and each providing commands to operate the auxiliary accessory when the port is a dumb port,

the central station being connected to the pads,

second means in the central station for processing the addresses and commands from the pads to obtain an operation of the vehicles in accordance with such addresses and commands,

third means in the central station for operating the auxiliary accessory in accordance with the commands from the pad when the central station determines that the port is a dumb port, and

fourth means for converting the commands from the pads to commands for operating the auxiliary accessory when the central station determines that the port is a smart port.

130. In a combination as set forth in claim 130,

fifth means in the central station for transmitting the address and the commands from the second means when the central station determines that the port is a dumb port and for transmitting the commands from the fourth means for operating the auxiliary accessory when the central station determines that the port is a smart port.

131. In a combination as set forth in claim 129,  
the second means including a first microcontroller and the fourth means including a second microcontroller different from the first microcontroller.

132. In combination for use in a system including a plurality of vehicles each responsive in a first relationship to an individual address and to a plurality of commands for providing operations of such individual one of the vehicles in accordance with such commands, the system including, in a second relationship, at least one auxiliary mechanism for receiving commands,  
a central station including a first microcontroller,  
a plurality of pads each operative to provide an address for selecting an individual one of the vehicles and to provide commands to such individual one of the vehicles for operating such individual one of the vehicles in accordance with such commands and each providing commands to obtain the operation of the auxiliary mechanism,  
a second microcontroller,

first means in the central station for processing the commands from the pads for determining whether such commands are intended for the vehicles or the auxiliary accessory,

second means in the central station including the first microcontroller for processing the address and commands for operation of the vehicles when the central station determines that the commands are intended for the vehicles and for introducing the addresses and commands to the second microcontroller when the central station determines that the addresses and commands from the pads are intended for the auxiliary accessory, and

third means including the second microcontroller for processing the addresses and commands from the central station to provide commands for operating the auxiliary accessory when the central station determines that the addresses and commands from the pads are intended for the auxiliary accessory.

133. In a combination as set forth in claim 132,

means in the central station for transmitting the processed addresses and commands from the first microcontroller when the central station determines that the addresses and commands from the pads are intended for the vehicles and for transmitting the commands from the third means when the central station determines that the addresses and commands from the pads are intended for the auxiliary apparatus.

134. In a combination as set forth in claim 132,

the first microcontroller being operative to pass the commands from the pads to the second microcontroller when the central station determines that the commands are intended for the auxiliary accessory,

the second microcontroller being operative to receive and process the commands from the first microcontroller simultaneously with the passage of the commands from the first microcontroller to the second microcontroller and to pass the processed commands from the second microcontroller to the first microcontroller during the passage of the commands from the first microcontroller to the second microcontroller.

135. In a combination as set forth in claim 132,

the first microcontroller being operating to pass successive groups of commands to the second microcontroller when the central station determines that the commands are intended for the auxiliary accessory,

the second microcontroller being operative to receive and process the commands from the first microcontroller simultaneously with the passage of commands from the first microcontroller to the second microcontroller,

the first microcontroller being responsive to the passage of the processed commands in each group from the second microcontroller to the second microcontroller for passing the commands in the next one of the successive groups from the first microcontroller to the second microcontroller for processing by the second microcontroller.

136. In combination for use with a central station and a plurality of pads operatively coupled to the central station and each operative to provide an address, and commands following such address, to the central station for transmission by the central station,

5 a plurality of vehicles each constructed to receive the addresses and commands transmitted by the central station from the pads and to respond to an individual one of the addresses from the central station and to operate in accordance with the commands following such individual one of the addresses,

10 first means in each of the vehicles for powering such vehicle for operation in accordance with the reception by such vehicle from the central station of the address individual to such vehicle and the commands following such address,

second means in each of the vehicles for depowering such vehicle when such vehicle fails to receive from the central station for a particular period of time the address individual to such vehicle or the commands following such address,

15 third means in each of the vehicles for determining the time since the last reception of a command from the central station to such vehicle, and

fourth means in each of the vehicles for providing a first indication with such vehicle in the powered state, a second indication different from the first indication with the vehicle in the depowered state and a third indication different from the first and second indications for a particular period of time before such vehicle becomes depowered.

137. In a combination as set forth in claim 136 wherein

5 the fourth means in each of the vehicles includes a light having a first state of illumination with such vehicle in the powered state, a second state of illumination with such vehicle in the depowered state and a third state of illumination for the particular period of time before such vehicle becomes depowered.

138. In combination,

a plurality of vehicles each responsive to an individual addresses for operation in accordance with commands provided to such vehicle,

a plurality of pads each operative to provide the address individual to such vehicles and  
5 to provide commands for operating such vehicles,

a central station operatively coupled to the pads for transmitting the addresses and  
commands from the pads to the vehicles,

first means in each of the vehicles for powering such vehicle in accordance with the  
address and commands provided by the central station to such vehicle,

10 second means in the central station for determining the period of time since the last time  
that each of the vehicles has received commands from the central station,

third means in the central station for transmitting a first signal to each vehicle to depower  
such vehicle when the central station fails to transmit any commands to such vehicle for a  
particular period of time,

15 fourth means in the central station for transmitting a second signal to each vehicle a  
particular period of time before such vehicle becomes depowered,

fifth means in each of the vehicles for providing a first indication when such vehicle is  
being powered,

sixth means in each of the vehicles for providing a second indication when such vehicle  
20 is depowered, and

seventh means in each of the vehicles for providing a third indication during the particular  
period of time before such vehicle is depowered.

139. In a combination as set forth in claim 138,

means in each of the vehicle for activating such vehicle upon the reception by such  
vehicle from the central station of the address individual to such vehicle and for operating the  
vehicle in accordance with the commands following such individual address.

140. In a combination as set forth in claim 139,

each of the vehicles having a light,

the sixth means in each of the vehicles being operative to provide a first state of  
illumination of the light in such vehicle,

- 5           the seventh means in each of the vehicles being operative to provide a second state of illumination of the light in such vehicle,
- the eighth means in each of the vehicles being operative to provide a third state of illumination of the light in such vehicle.

141. In a combination as set forth in claim 139,

sixth means in each of the vehicles for determining the period of time since the last reception by such vehicle of commands addressed to such vehicle and for depowering such vehicle after the particular period of time.

142. In combination,

a plurality of vehicles each responsive to an individual address provided to such vehicle and each operative in accordance with commands provided to such vehicle after the reception by such vehicle of such individual address,

5 a plurality of pads each operative to provide the addresses individual to such vehicles and to provide the commands for operating such vehicles,

a central station operatively coupled to the pads for receiving the addresses and the commands from the pads and for providing carrier signals at a particular frequency and for modulating the carrier signals in accordance with the addresses and commands from the pads,

10 means in the central station for transmitting the modulated carrier signals to the vehicles,

means in each of the vehicles for powering such vehicle upon the reception by the vehicle from the central station of carrier signals modulated with the address individual to such vehicle and the commands following such address,

15 means responsive in each of the vehicle to the address individual to such vehicle for operating the vehicle in accordance with the commands following such address, and

means responsive in each of the vehicles to the failure of such vehicle to receive carrier signals from the central station for depowering such vehicle.

143. In a combination as set forth in claim 142,

means in each of the vehicles for providing a first state of illumination in such vehicle with such vehicle powered and a second state of illumination in such vehicle with such vehicle depowered.

144. In combination for use with a plurality of pads each operative to provide an address and commands and a central station for transmitting at a particular frequency a carrier signal modulated with the addresses and commands from the pads,

a vehicle,

5 means in the vehicle for receiving from the central station the carrier signals modulated with the address individual to such vehicle,

means for powering the vehicle in accordance with the reception by such vehicle of the modulated carrier signals individual to such vehicle,

10 means in the vehicle for demodulating the modulating carrier signals to recover the commands individual to such vehicle,

means for operating the vehicle in accordance with the commands recovered by such vehicle, and

means in the vehicle for depowering the vehicle upon the failure of the vehicle to receive carrier signals from the central station.

145. In a combination as set forth in claim 144,

the vehicle including wheels and an operating member different from the wheels,

the operating means being responsive to the demodulated commands for operating the wheels to move the vehicle, and for operating the member, in accordance with such demodulated  
5 commands.

146. In combination for use with a plurality of pads each operative to provide an address and commands and a central station for transmitting at a particular frequency a carrier signal modulated with the addresses and commands from the pads,

a vehicle,

5 means in the vehicle for receiving from the central station the carrier signals modulated with the address individual to such vehicle,

means for powering the vehicle in accordance with the reception by such vehicle of the modulated carrier signals individual to such vehicle,



means in the vehicle for demodulating the modulating carrier signals to recover the  
10 commands individual to such vehicle,

the vehicle including wheels for moving the vehicle and including motors for rotating the  
wheels,

means in the receiver for providing pulse width modulations for energizing the motors  
in the vehicle to move the vehicle, the pulse width modulations providing progressive increments  
15 of time for energizing the motors to accelerate the vehicle, and

means in the receiver for progressively energizing the motors with the pulse with  
modulations for the progressive increments of time to accelerate the motors.

147. In a combination as set forth in claim 146,

the vehicles being progressively energized with the pulse width modulations for the  
progressive increments of time from a zero time in the pulse width modulations to accelerate the  
motors in the vehicle.

148. In combination,

a plurality of vehicles each responsive to an individual address provided to such vehicle  
and each operative in accordance with commands provided to such vehicle after the reception  
by such vehicle of such individual address,

5 a plurality of pads each operative to provide the addresses individual to such vehicles and  
to provide the commands for operating such vehicles,

a central station operatively coupled to the pads for receiving the addresses and the  
commands from the pads and for transmitting such addresses and commands to the vehicles in  
packets each composed of a plurality of binary indications representing the address and the  
10 commands for an individual one of the vehicles and each having start bits at the beginning of the  
packet and having the address following the start bits and having the commands following the  
address, the packets from the different pads in the plurality following one another with no time  
separation between successive ones of the packets,

means in the central station for transmitting the packets of the binary indications to the  
15 vehicles,

means in the vehicles for receiving the packets of the binary indications transmitted by the central station, and

means responsive in each of the vehicles to the address individual to such vehicle for operating the vehicle in accordance with the commands following such address.

149. In a combination as set forth in claim 148,

each of the vehicles having wheels,

each of the vehicles having an operating member different from the wheels, and

5 each of the packets including first commands for rotating the wheels in an individual one of the vehicles in accordance with the binary indications representing in such packet such individual one of the vehicles and including second commands for rotating the wheels in such individual one of the packets and including third commands for operating the member in such individual one of the packets,

10 means in each of the vehicles for rotating the wheels in such vehicle in accordance with the first commands in the packets addressed to such vehicle, and

means in each of the vehicles for operating the operating member in such vehicle in accordance with the second commands in the packets addressed to such vehicle.

150. In combination,

a plurality of vehicles each responsive to an individual address for operation in accordance with commands provided to such vehicle,

5 a plurality of pads each operative to provide the addresses individual to such vehicles and to provide commands for operating such vehicles,

a central station operatively coupled to the pads for transmitting the addresses and commands from the pads to the vehicles,

a light indication in each of the vehicles, and

10 means in each of the vehicles for providing an illumination of the light in the vehicle when an individual one of the pads addresses the vehicle and before the vehicle receives the commands from such individual one of the pads.

151. In a combination as set forth in claim 150,  
means in each vehicle for powering such vehicle when the individual one of the pads  
addresses such vehicle, and  
means in each of the vehicles for depowering such vehicle when the vehicle fails to  
receive commands from any of the pads for a particular period of time.

ABSTRACT OF THE DISCLOSURE

A system and method for controlling toy vehicles has a plurality of pads coupled to a central station. Switches in the pads may be closed to select toy vehicles and the operation of motors for moving the vehicles forwardly, rearwardly, to the left and to the right and moving upwardly and downwardly a receptacle or bin for holding transportable elements (e.g. marbles). The pads may be set in a mode to allow sharing of a vehicle by more than one pad. The pads are connected by wires to the central station, and may be interrogated selectively, sequentially or simultaneously by the central station. The central station forms packets of signals representative of the switch closures of the interrogated pads, and transmits the packets over a modulated carrier frequency to receivers in the vehicles. Each of the packets includes a binary signal addressing the vehicle selected by the pad whose switch closures are represented by the packet of data. The central station prioritizes the transmission of the packets to improve vehicle control. An accessory, or a second central station, may be coupled to a smart port of the first central station. When the pads are interrogated by the central station, the signals from the pads may be routed to the accessory or second central station for processing, then sent back to the first central station for transmission to the vehicles. The pads include a flashback feature that automatically selects a previously selected vehicle. The motors of the vehicles may be energized using pulse width modulation to control the speed of the motor. Signals received by the vehicle are asserted to the motors in the first part of a duty cycle. The vehicles monitor all packets, and decode packets addressed to the vehicle to execute the commands represented by signals contained within the packet. When a packet is determined to be invalid, the vehicle ignores the packet.

Applicant or Patentee: Peter C. DeAngelis Attorney's  
Serial or Patent No: \_\_\_\_\_ Docket No. 40907  
Filed or Issued: \_\_\_\_\_  
For: SYSTEM AND METHOD FOR CONTROLLING THE OPERATION OF TOYS

**VERIFIED STATEMENT (DECLARATION) CLAIMING SMALL ENTITY  
STATUS (37 CFR 1.9(f) and 1.27(c)) - SMALL BUSINESS CONCERN**

I hereby declare that I am  
☐ the owner of the small business concern identified below  
☐ an official of the small business concern empowered to act on  
behalf of the concern identified below:

NAME OF CONCERN: ROKENBOK TOY COMPANY  
ADDRESS OF CONCERN: 119 Aberdeen, Suite 7, Cardiff, CA 92007

I hereby declare that the above identified small business concern qualifies as a small business concern as defined in 13 CFR 121.3-18, and reproduced in 37 CFR 1.9(d), for purposes of paying reduced fees under Section 41(a) and (b) of Title 35, United States Code, in that the number of employees of the concern, including those of its affiliates, does not exceed 500 persons. For purposes of this statement, (1) the number of employees of the business concern is the average over the previous fiscal year of the concern of the persons employed on a full-time, part-time, or temporary basis during each of the pay periods of the fiscal year, and (2) concerns are affiliates of each other when either, directly or indirectly, one concern controls or has the power to control the other, or a third party or parties controls or has the power to control both.

I hereby declare that rights under contract or law have been conveyed to and remain with the small business concern identified above with regard to the invention entitled: SYSTEM AND METHOD FOR CONTROLLING THE OPERATION OF TOYS by Peter C. DeAngelis described in \_\_\_\_\_

☒ the specification filed herewith  
☐ application Serial No. \_\_\_\_\_, filed \_\_\_\_\_  
☐ Patent No. \_\_\_\_\_, issued \_\_\_\_\_

If the rights held by the above identified small business concern are not exclusive, each individual, concern or organization having rights to the invention is listed below\* and no rights to the invention are held by any person, other than the inventor, who could not qualify as a small business concern under 37 CFR 1.9(d) or by any concern which would not qualify as a small business concern under 37 CFR 1.9(d) or a nonprofit organization under 37 CFR 1.9(e).

\* Note: Separate verified statements are required for each named person, concern, or organization having rights to the invention averring to their status as small entities. (37 CFR 1.27)

FULL NAME:  
ADDRESS:

☐ Individual ☐ Small Business Concern ☐ Nonprofit organization

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. (37 CFR 1.28(b))

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

NAME OF PERSON SIGNING: Paul Eichen  
TITLE OF PERSON OTHER THAN OWNER: CEO  
ADDRESS OF PERSON SIGNING: 119 Aberdeen, Suite 7, Cardiff, CA 92007

SIGNATURE: Paul Eichen DATE: 2/7/96

Applicant or Patentee: Peter C. DeAngelis Attorney's  
Serial or Patent No.: \_\_\_\_\_ Docket No. 1907  
Filed or Issued: \_\_\_\_\_  
For: SYSTEM AND METHOD FOR CONTROLLING THE OPERATION OF TOYS

**VERIFIED STATEMENT (DECLARATION) CLAIMING SMALL ENTITY  
STATUS (37 CFR 1.9(f) and 1.27(b)) - INDEPENDENT INVENTOR**

As the below named inventor, I hereby declare that I qualify as an independent inventor as defined in 37 CFR 1.9(c) for purposes of paying reduced fees under Section 41(a) and (b) of Title 35, United States Code, to the Patent and Trademark Office with regard to the invention entitled: SYSTEM AND METHOD FOR CONTROLLING THE OPERATION OF TOYS described in

- ☒ the specification filed herewith  
☐ application Serial No. \_\_\_\_\_, filed \_\_\_\_\_  
☐ Patent No. \_\_\_\_\_, issued \_\_\_\_\_

I have not assigned, granted, conveyed or licensed and am under no obligation under contract or law to assign, grant, convey or license, any rights in the invention to any person who could not be classified as an independent inventor under 37 CFR 1.9(c) if that person had made the invention, or to any concern which would not qualify as a small business concern under 37 CFR 1.9(d) or a nonprofit organization under 37 CFR 1.9(e).

Each person, concern, or organization to which I have assigned, granted, conveyed, or licensed or am under or may be under an obligation under contract or law to assign, grant, convey, or license any rights in the invention is listed below:

- ☐ no such person, concern, or organization  
☐ persons, concerns or organizations listed below\*

\* Note: Separate verified statements are required for each named person, concern, or organization having rights to the invention averring to their status as small entities. (37 CFR 1.27)

FULL NAME: \_\_\_\_\_  
ADDRESS: \_\_\_\_\_  
☐ individual ☐ Small Business Concern ☐ nonprofit organization

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or maintenance fee due after the date on which status as a small entity is no longer appropriate. (37 CFR 1.28(b))

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and believe are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

Name of Inventor: Peter C. DeAngelis

Signature of Inventor: Peter C. DeAngelis

Date: Feb 7, 1997

FITZGERA\ROST\40907\SMALL.IND

EXPRESS MAIL NO. EM218452412US

Please acknowledge receipt of our **INFORMATION DISCLOSURE STATEMENT** (2pgs-duplicate), PTO Form 1449 (3pgs), and 29 attached cited references in re application of:

Inventor: Peter C. DeAngelis  
Serial No.: 08/797,188  
Filed: 02/11/97  
Title: SYSTEM AND METHOD FOR CONTROLLING THE OPERATION OF TOYS  
Mailed: May 12, 1997  
May 11, 1997 (Sunday)  
JKF:mmm

Please acknowledge receipt of our **INFORMATION DISCLOSURE STATEMENT** (2pgs-duplicate), PTO Form 1449 (3pgs), and 29 attached cited references in re application of:

Inventor: Peter C. DeAngelis  
Serial No.: 08/797,188  
Filed: 02/11/97  
Title: SYSTEM AND METHOD FOR CONTROLLING THE OPERATION OF TOYS  
Mailed: May 12, 1997  
Due: May 11, 1997 (Sunday)  
Atty/Client ID/Docket No.: ROKEN-46907 JKF:vm


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6/10/97



**PATENT**  
**Docket No. 40907**

**CERTIFICATE OF MAILING UNDER 37 CFR §1.8**

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first-class mail in an envelope addressed to Assistant Commissioner for Patents, Washington, D.C. 20231 on May 12, 1997.

 5/12/97  
John K. Fitzgerald, Reg. No. 38,881 Date

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In Re Application Of:	)	Group Art Unit: 3301
Peter C. DeAngelis	)	
	)	
Serial No.: 08/797,188	)	Date: May 12, 1997
	)	
Filed: February 11, 1997	)	
	)	
For: SYSTEM AND METHOD FOR	)	
CONTROLLING THE OPERATION)	)	
OF TOYS	)	
	)	
	)	

**INFORMATION DISCLOSURE STATEMENT**

Assistant Commissioner for Patents  
Washington, D.C. 20231

Dear Sir:

This application is for U.S. Serial No. 08/797,188,  
filed February 11, 1997.

Pursuant to the duty of disclosure, according to 37  
C.F.R. Sections 1.56, 1.97 and 1.98, Applicant submits for the



Examiner's consideration the additional references listed on the attached sheet PTO Form FB-A820. Applicant has enclosed copies of these references for the Examiner's consideration.

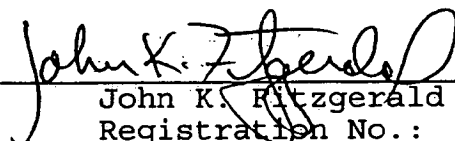
The Commissioner is hereby authorized to charge any fees payable in connection with this Information Disclosure Statement to Deposit Account No. 06-2425. A duplicate copy of this document is enclosed.

Respectfully submitted,

FULWIDER PATTON LEE & UTECHT, LLP

Date: May 12, 1997

By:



John K. Fitzgerald  
Registration No.: 38,881  
Attorney for Applicant

JKF:vmm

Enclosures: Form PTO-FB-A820  
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Los Angeles, California 90024  
Tel (310) 824-5555  
Fax (310) 824-9696

FORM PTO-1449

**INFORMATION DISCLOSURE CITATION  
IN AN APPLICATION**  
(Use Several Sheets if Necessary)

DOCKET NUMBER (OPTIONAL)  
40907APPLICATION NO.  
08/797,188

APPLICANT

Peter C. DeAngelis

FILING DATE

02/11/97

GROUP ART UNIT

3301

## U.S. PATENT DOCUMENTS

EXAMINER INITIAL		DOCUMENT NUMBER	DATE	NAME	CLASS	SUB CLASS	FILING DATE IF APPROPRIATE
		5,474,486	12/12/95	Chilton et al.	456	456	12/02/93
		5,471,668	11/28/95	Soenen et al.	455	352	06/15/94
		5,435,768	07/25/95	Dunleavy	446	427	05/04/94
		5,435,553	07/25/95	Arima et al.	273	865	02/22/93
		5,429,543	07/04/95	Tilbor et al.	446	456	07/31/92
		5,364,108	11/15/94	Esnouf	273	430	04/08/93
		5,148,159	09/15/92	Clark et al.	340	825.22	04/26/89
		5,135,427	08/04/92	Suto et al.	446	433	09/13/91
		5,098,110	03/24/92	Yang	273	438	07/06/90
		5,073,750	12/17/91	Coron	318	58.7	01/30/90
		5,452,901	09/26/95	Nakada et al.	273	310	06/29/94

## FOREIGN PATENT DOCUMENTS

## OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)

EXAMINER

DATE CONSIDERED

**EXAMINER** Initial citation considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication with applicant.

PTO/SB/08(2-92)

JKF/ROST/40907/PTO1449.512

Patent and Trademark Office, U.S. Department of Commerce

FORM PTO-1449

**INFORMATION DISCLOSURE CITATION  
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(Use Several Sheets if Necessary)

DOCKET NUMBER (OPTIONAL)  
40907APPLICATION NO.  
08/797,188

APPLICANT

Peter C. DeAngelis

FILING DATE

02/11/97

GROUP ART UNIT

3301

## U.S. PATENT DOCUMENTS

EXAMINER INITIAL		DOCUMENT NUMBER	DATE	NAME	CLASS	SUB CLASS	FILING DATE IF APPROPRIATE
		4,817,948	04/04/89	Simonelli	273	86 B	09/06/83
		4,563,626	01/07/86	Ohtake	446	454	09/13/84
		4,334,221	06/08/82	Rosenhagen et al.	340	825.72	10/22/79
		4,226,292	10/07/80	Monte et al.	180	6.5	02/01/79
		4,213,270	07/22/80	Oda	463	254	08/07/78
		4,197,672	04/15/80	Mabuchi et al.	46	254	11/22/78
		4,171,468	10/16/79	Reiner	179	15 AW	11/22/77
		4,141,553	02/27/79	Beny et al.	273	86 B	09/06/77
		4,135,181	01/16/79	Bogacki et al.	340	310 A	01/30/76
		4,087,799	05/02/78	Brouwer	340	237.5	07/08/76

## FOREIGN PATENT DOCUMENTS

		DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUB CLASS	TRANSLATION	
							YES	NO

## OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)


EXAMINER

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PTO/SB/08(2-92)

JKFAROSTS40730/PTO1449.512

Patent and Trademark Office, U.S. Department of Commerce

FORM PTO-1449

**INFORMATION DISCLOSURE CITATION  
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(Use Several Sheets if Necessary)

DOCKET NUMBER (OPTIONAL)  
40907APPLICATION NO.  
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Peter C. DeAngelisFILING DATE  
02/11/97GROUP ART UNIT  
3301

## U.S. PATENT DOCUMENTS

EXAMINER INITIAL	DOCUMENT NUMBER	DATE	NAME	CLASS	SUB CLASS	FILING DATE IF APPROPRIATE
	4,080,602	03/21/78	Hattori et al.	343	225	02/12/76
	3,926,434	12/16/75	Cannon Jr.	373	86 B	04/19/74
	3,782,031	01/01/74	Byron	46	244 R	02/23/72
	3,639,755	02/01/72	Wrege	246	187 B	01/02/70
	3,596,400	08/03/71	Cheng	463	235 B	11/06/68
	3,482,046	12/02/69	Hughson et al.	179	154	04/04/63
	3,400,488	09/10/68	Phillpott et al.	469	244	04/04/66
	3,303,821	02/14/67	Harris	119	29	09/24/65

## FOREIGN PATENT DOCUMENTS

	DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUB CLASS	TRANSLATION	
						YES	NO

## OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)


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**EXAMINER** Initial citation considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication with applicant.

Please acknowledge receipt of Preliminary Amendment (w/Certificate of Mailing thereon); by affixing hereon the Patent and Trademark Office stamp and returning this card to our office in re application of:

Applicant: PETER C. DeANGELIS

Client: Rokenbok Toy Company

Title: SYSTEM AND METHOD FOR CONTROLLING THE  
OPERATION OF TOYS

Serial No.: 08/797,188

Filing Date: February 11, 1997

Client/Matter No.: ROKEN-40907

Date Mailed: October 28, 1997

ERR:dmc

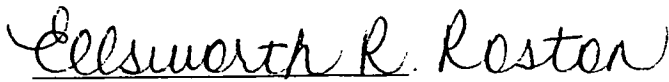
BOX NON-FEE AMENDMENT

received  
11/19/97



CERTIFICATE OF MAILING UNDER 37 C.F.R. § 1.8

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Commissioner for Patents, Washington, D.C.  
20231 on October 28, 1997.

  
Ellsworth R. Roston, Reg. No. 16,310

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of	)	Examiner: J. Moore
	)	
Peter C. DeAngelis	)	Group Art Unit: 3301
	)	
Serial No: 08/797,188	)	Docket No. ROKEN-40907
	)	
Filed: February 11, 1997	)	Date: October 28, 1997
	)	
For: SYSTEM AND METHOD	)	Los Angeles, California
FOR CONTROLLING THE		
OPERATION OF TOYS		

PRELIMINARY AMENDMENT

Assistant Commissioner for Patents  
Washington, D.C. 20231

Sir:

Please amend the above-identified application as follows:

IN THE SPECIFICATION:

Page 27, line 3, change "have" to -- has --.

Page 30, line 19, change "include" to -- includes --.

Page 31, line 10, before "ACCIO" delete -- lines --.

Page 31, line 24, change "had" to -- has --.

Page 31, line 24, change "an" to -- a --.

Page 33, line 8, change "12" to -- 11 --.

Page 33, line 20, change "is" to -- in --.

Page 38, line 23, change "pervious" to -- previous --.

Page 44, line 24, delete "If" and capitalize the -- "T" -- in the beginning of the sentence.

Page 47, line 8, change "122" to -- 94 --.

Page 50, line 18, change "enableable" to -- enable --.

Page 50, line 19, change "enableable" to -- enable --.

Page 51, line 1, change "enableable" to -- enable --.

IN THE CLAIMS:

1 Claim 26, line <sup>16</sup>~~15~~, before "any" insert a comma (,).

1 Claim 38 (amended): In a combination as set forth in claim 36,  
2 means in the central station for transmitting at each instant only the binary  
3 indications from [th epads] the pads which are providing changes in addresses or  
4 commands at that instant.

1 Claim 49, line 17, after the comma (,) insert -- and --.

1 Claim 112 (amended): In a combination as set forth in claim 111 wherein  
2 the central station [for transmitting] transmits to the vehicles at each  
3 instant only the commands from the pads which are providing changes in commands  
4 at that instant.

1 Claim 134 (amended): In a combination as set forth in claim 132,  
2 the first microcontroller being operative to pass the commands from the  
3 pads to the second microcontroller when the central station determines that the  
4 commands are intended for the auxiliary accessory, the second microcontroller being  
5 operative to receive and process the commands from the first microcontroller  
6 [simultaneously with the passage of the commands from the first microcontroller to  
7 the second microcontroller] and to pass the processed commands from the second  
8 microcontroller to the first microcontroller [during the passage of the commands  
9 from the first microcontroller to the second microcontroller].

1 Claim 135 (amended): In a combination as set forth in claim 132,  
2 the first microcontroller being operating to pass successive groups of  
3 commands to the second microcontroller when the central station determines that  
4 the commands are intended for the auxiliary accessory, the second microcontroller



1 being operative to receive and process the commands from the first microcontroller  
2 [simultaneously with the passage of commands from the first microcontroller to the  
3 second microcontroller],

4 the first microcontroller being responsive to the passage of the processed  
5 commands in each group from the second microcontroller to the [second] first  
6 microcontroller for passing the commands in the next one of the successive groups  
7 from the first microcontroller to the second microcontroller for processing by the  
8 second microcontroller.

16  
1 Claim 146, line 17, change "with" to -- width --.

1 Claim 149 (amended): In a combination as set forth in claim 148,  
2 each of the vehicles having wheels,  
3 each of the vehicles having an operating member different from the wheels,  
4 and

5 each of the packets including first commands for rotating the wheels in an  
6 individual one of the vehicles in accordance with the binary indications representing  
7 in such packet such individual one of the vehicles [and including second commands  
8 for rotating the wheels in such individual one of the packets] and including [third]  
9 second commands for operating the member in such individual one of the packets,

10 means in each of the vehicles for rotating the wheels in such vehicle in  
11 accordance with the first commands in the packets addressed to such vehicle, and  
12 means in each of the vehicles for operating the operating member in such  
13 vehicle in accordance with the second commands in the packets addressed to such  
14 vehicle.

REMARKS

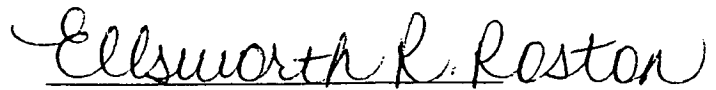
Applicant has amended the specification and claims to correct informalities.

Serial No. 08/797,188

*PATENT*

Reconsideration and allowance of the application are respectfully  
requested.

Respectfully submitted,

A handwritten signature in cursive script that reads "Ellsworth R. Roston". The signature is written in dark ink and is positioned above the printed name and title.

Ellsworth R. Roston  
Registration No. 16,310  
Attorney for Applicant

ERROSTON:dmc

FULWIDER PATTON LEE & UTECHT, LLP  
10877 Wilshire Boulevard, Tenth Floor  
Los Angeles, CA 90024  
Telephone: (310) 824-5555

Please acknowledge receipt of Preliminary Amendment (w/Certificate of Mailing thereon); by affixing hereon the Patent and Trademark Office stamp and returning this card to our office in re application of:

Applicant: PETER C. DeANGELIS

Client: Rokenbok Toy Company

Title: SYSTEM AND METHOD FOR CONTROLLING THE  
OPERATION OF TOYS

Serial No.: 08/797,188

Filing Date: February 11, 1997

Client/Matter No.: ROKEN-40907

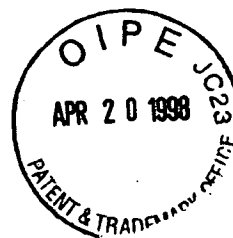
Date Mailed: October 28, 1997

ERR:dmc

BOX NON-FEE AMENDMENT

Please acknowledge receipt of Preliminary Amendment (w/Certificate of Mailing thereon); Modified Form PTO-1083 (in duplicate); by affixing hereon the Patent and Trademark Office stamp and returning this card to our office in re application of:

Applicant: PETER C. DE ANGELIS  
Title: SYSTEM AND METHOD FOR CONTROLLING THE  
OPERATION OF TOYS  
Serial No.: 08/797,188  
Filing Date: February 11, 1998  
Client/Matter No.: ROKEN-40907  
Date Mailed: April 16, 1998  
ERR/cm



BOX NON-FEE AMENDMENT

received  
4/21/98 MLO

Date: April 16, 1998

In re application of: PETER C. DE ANGELIS

Serial No.: 08/797,188

Filed: February 11, 1998

For: SYSTEM AND METHOD FOR CONTROLLING THE OPERATION OF TOYS

BOX NON-FEE AMENDMENT

ASSISTANT COMMISSIONER FOR PATENTS

Washington, D.C. 20231

Sir:

Transmitted herewith is an amendment in the above-identified application:

- ☐ Small entity status of this application under 37 CFR 1.9 and 1.27 has been established by a verified statement previously submitted.
- ☐ A verified statement to establish small entity status under 37 CFR 1.9 and 1.27 is enclosed.
- ☒ No additional fee is required.

The fee has been calculated as shown below:

	COL. (1)	COL. (2)	COL. (3)	
	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NO. PREVIOUSLY PAID FOR	PRESENT EXTRA
TOTAL	133	MINUS	151	0
INDEP.	45	MINUS	51	0
<input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEP. CLAIM				

## SMALL ENTITY

RATE	FEE
X \$ 11	\$
X \$ 41	\$
+ \$135	\$
1 MO. EXT. \$ 55	\$
2 MO. EXT. \$ 200	\$
3 MO. EXT. \$ 475	\$
TOTAL ADDL. FEE	\$ _____

## OTHER THAN A SMALL ENTITY

RATE	ADDITIONAL FEE
X \$ 22	\$
X \$ 82	\$
+ \$270	\$
1 MO. EXT. \$ 110	\$
2 MO. EXT. \$ 400	\$
3 MO. EXT. \$ 950	\$
TOTAL ADDL. FEE	\$ _____

- \* If the entry in Col. 1 is less than the entry in Col. 2, write "0" in Col. 3.
- \*\* If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, write "20" in this space.
- \*\*\* If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, write "3" in this space.
- The "Highest Number Previously Paid For" (Total or independent) is the highest number found from the equivalent box in Col. 1 of a prior amendment or the number of claims originally filed.

- ☐ Please charge my Deposit Account No. 06-2425 the amount of \$ \_\_\_\_\_. A duplicate of this sheet is enclosed.
- ☐ A check in the amount of \$ \_\_\_\_\_ to cover the filing fee is enclosed.
- ☒ The Commissioner is hereby authorized to charge payment of the following fees associated with this communication or credit any overpayment to Deposit Account No. 06-2425. A duplicate copy of this sheet is enclosed.
- ☒ Any additional filing fees required under 37 CFR 1.16 for the presentation of extra claims.
- ☐ Any patent application processing fees under 37 CFR 1.17.

FULWIDER PATTON LEE & UTECHT, LLP  
ATTORNEYS AT LAW  
Center West  
10877 Wilshire Boulevard, Tenth Floor  
Los Angeles, California 90024

Respectfully submitted,

Ellsworth R. Roston  
Ellsworth R. Roston, Reg. No. 16,310

ERR/cm

PATENT

CERTIFICATE OF MAILING UNDER 37 C.F.R. § 1.8

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20231 on April 16, 1998.

Ellsworth R. Roston  
Ellsworth R. Roston, Reg. No. 16,310

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of	)	Examiner: J. Moore
	)	
Peter C. DeAngelis	)	Group Art Unit: 3301
	)	
Serial No: 08/797,188	)	Docket No. ROKEN-40907
	)	[#100970/v.1]
	)	
Filed: February 11, 1998	)	Date: April 16, 1998
	)	
For: SYSTEM AND METHOD FOR	)	Los Angeles, California
CONTROLLING THE	)	
OPERATION OF TOYS	)	
	)	

PRELIMINARY AMENDMENT

BOX NON-FEE AMENDMENT  
Assistant Commissioner for Patents  
Washington, D.C. 20231

Sir:

Please amend the above-identified application as follows:



Serial No. 08/797,188

PATENT

IN THE CLAIMS:

Cancel claims 14-15, 31, 114-115, 116-118, 119-121, 129-131, 132-135 in  
Application No. 08/979,188 (ROKEN-40907) without prejudice.

REMARKS

Claims 14-15, 31, 114-115, 116-118, 119-121, 129-131 and 132-135 have been  
cancelled from this application and have been transferred to Application No. 09/022,268  
which has been assigned of record to the assignee of record of this application.

Reconsideration and allowance of the application are respectfully requested.

Respectfully submitted,

Ellsworth R. Roston

Ellsworth R. Roston

Registration No. 16,310

Attorney for Applicant

ERR:cm

FULWIDER PATTON LEE & UTECHT, LLP  
10877 Wilshire Boulevard, Tenth Floor  
Los Angeles, CA 90024  
TEL: (310) 824-5555  
FAX: (310) 824-9696  
[#100970/v.1]

Please acknowledge receipt of Preliminary Amendment (w/Certificate of Mailing thereon); Modified Form PTO-1083 (in duplicate); by affixing hereon the Patent and Trademark Office stamp and returning this card to our office in re application of:

Applicant: PETER C. DE ANGELIS

Title: SYSTEM AND METHOD FOR CONTROLLING THE  
OPERATION OF TOYS

Serial No.: 08/797,188

Filing Date: February 11, 1998

Client/Matter No.: ROKEN-40907

Date Mailed: April 16, 1998

ERR/cm

BOX NON-FEE AMENDMENT

Please acknowledge receipt of our Information Disclosure Statement (w/Certificate of Mailing thereon); Form PTO-FB-A820, and return card, by affixing hereon the Patent and Trademark Office stamp and returning this card to our office in re application:

Applicant(s): PETER C. DE ANGELIS  
Client: ROKENBOK TOY COMPANY  
Title: SYSTEM AND METHOD FOR CONTROLLING THE OPERATION OF TOY  
Serial No.: 08/797,188  
Filing Date: February 11, 1998  
Client/Matter No.: ROKEN-40907  
Date Mailed: May 7, 1998

ERR/cm

received  
5/18/98



PATENT

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Service with sufficient postage as First  
Class Mail in an envelope addressed to:  
Assistant Commissioner for Patents,  
Washington, D.C. 20231 on May 7, 1998.

Elsworth R. Roston

Ellsworth R. Roston, Registration No. 16,310

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re application of:	)	
	)	
Inventor(s): PETER C. DEANGELIS	)	Group Art Unit: 3301
	)	
Serial No. 08/797,188	)	Docket: ROKEN-40907
	)	
Filed: February 11, 1998	)	Date: May 7, 1998
	)	
For: SYSTEM AND METHOD FOR	)	Los Angeles, California 90024
CONTROLLING THE	)	
OPERATION OF TOYS	)	

**INFORMATION DISCLOSURE STATEMENT**

Assistant Commissioner for Patents  
Washington, D.C. 20231

Dear Sir:

In compliance with applicant's duty to disclose information which may  
be material to the prosecution of the application, applicant wishes to make of record

[#101115/v.9]

PATENT

the documents identified on the modified Form PTO 1449 (A820) submitted concurrently herewith.

Applicants are submitting this Information Disclosure Statement to call certain prior art to the attention of the Examiner. This prior art was cited in a PCT International Search Report submitted in the corresponding PCT application. This Search Report was called to the attention of applicant's attorney on March 16, 1998.

The Commissioner is hereby authorized to charge any fees payable in connection with this Information Disclosure Statement to Deposit Account No. 06-2425. A duplicate copy of this document is enclosed.

Respectfully submitted,

FULWIDER PATTON LEE & UTECHT, LLP

Ellsworth R. Roston

Ellsworth R. Roston, Esq.

Reg. No. 16,310

10877 Wilshire Blvd., Tenth Floor  
Los Angeles, CA 90024  
Tel. No. (310) 824-5555  
Fax No. (310) 824-9696

ERR:cm

Encls.: Return Postcard  
PTO-1449 (FB-A820)

U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE  <b>INFORMATION DISCLOSURE CITATION</b> (Use Several Sheets if Necessary)				ATTY. DOCKET NO. <b>ROKEN-40907</b>		SERIAL NO. <b>08/797,188</b>	
				APPLICANT <b>PETER C. DE ANGELIS.</b>			
				FILING DATE <b>February 11, 1998</b>		GROUP <b>3301</b>	
<b>U.S. PATENT DOCUMENTS</b>							
EXAMINER INITIAL		DOCUMENT NUMBER	DATE	NAME	CLASS	SUB CLASS	FILING DATE IF APPLICABLE
		4,334,221	6/82	Rosenhagen et al			
		5,135,427	8/92	Suto et al			
		5,435,553	7/95	Arima et al			
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		5,435,768	7/95	Dunleavy			
		3,596,400	8/71	Cheng			
		5,474,486	12/95	Chilton et al			
		5,073,750	12/91	Coron			
		4,213,270	7/80	Oda			
		4,226,292	10/80	Monte et al			
		4,197,672	4/80	Mabuchi et al			
EXAMINER				DATE CONSIDERED			
<b>EXAMINER</b> Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication with applicant.							

Form PTO-FB-A820  
 (also form PTO-1449)

U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE				ATTY. DOCKET NO. <b>ROKEN-40907</b>		SERIAL NO. <b>08/797,188</b>	
<b>INFORMATION DISCLOSURE CITATION</b> (Use Several Sheets if Necessary)				APPLICANT <b>PETER C. DE ANGELIS</b>			
<b>PAGE 2</b>				FILING DATE <b>February 11, 1998</b>		GROUP <b>3301</b>	
<b>U.S. PATENT DOCUMENTS</b>							
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		3,303,821	2/67	Harris			
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		5,148,159	9/92	Clark et al			
		4,563,626	1/86	Ohtake			
		4,817,948	4/89	Simonelli			
		5,452,901	9/95	Nakada et al			
		5,098,110	3/92	Yang			
		3,400,488	9/68	Phillpott et al			
		3,482,046	12/69	Hughson et al			
EXAMINER				DATE CONSIDERED			
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Form PTO-FB-A820  
 (also form PTO-1449)

U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE				ATTY. DOCKET NO. <b>ROKEN-40907</b>		SERIAL NO. <b>08/797,188</b>	
<b>INFORMATION DISCLOSURE CITATION</b> (Use Several Sheets if Necessary)				APPLICANT <b>PETER C. DE ANGELIS</b>			
<b>PAGE 3</b>				FILING DATE <b>February 11, 1998</b>		GROUP <b>3301</b>	
<b>U.S. PATENT DOCUMENTS</b>							
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		3,639,755	2/72	Wrege			
		3,782,031	1/74	Byron			
		4,080,602	3/78	Hattori et al			
		4,135,181	1/79	Bogacki et al			
		4,171,468	10/79	Reiner			
		4,087,799	5/78	Bouwer			
		4,141,553	2/79	Beny et al			
EXAMINER				DATE CONSIDERED			
<b>EXAMINER</b> Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication with applicant.							

Form PTO-FB-A820  
 (also form PTO-1449)



Please acknowledge receipt of our Information Disclosure Statement (w/Certificate of Mailing thereon); Form PTO-FB-A820, and return card, by affixing hereon the Patent and Trademark Office stamp and returning this card to our office in re application:

Applicant(s): PETER C. DE ANGELIS  
Client: ROKENBOK TOY COMPANY  
Title: SYSTEM AND METHOD FOR CONTROLLING THE  
OPERATION OF TOY  
Serial No.: 08/797,188  
Filing Date: February 11, 1998  
Client/Matter No.: ROKEN-40907  
Date Mailed: May 7, 1998

ERR/cm

received  
12/11/98  
ERR/cm

Applicant: ROKENBOK TOY COMPANY

Docket No.: ROKEN-40907

Atty/Secy: ERR/cm

Serial No.: 08/797,188

Filed: February 11, 1998

Title: SYSTEM AND METHOD FOR CONTROLLING THE OPERATION OF TOYS

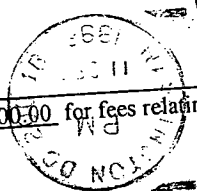
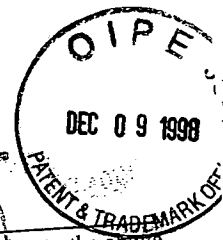
Inventor(s): PETER C. DeANGELIS

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<h1>TRANSMITTAL FORM</h1> <p><i>(to be used for all correspondence after initial filing)</i></p>	Application Number	08/797,188
	Filing Date	February 11, 1998
	First Named Inventor	PETER C. DeANGELIS
	Group Art Unit	3301
	Examiner Name	J. Moore
Total Number of Pages in This Submission	Attorney Docket Number	ROKEN-40907

ENCLOSURES (check all that apply)		
<input checked="" type="checkbox"/> Fee Transmittal Form <input checked="" type="checkbox"/> Fee Attached <input checked="" type="checkbox"/> Amendment / Response <input type="checkbox"/> After Final <input type="checkbox"/> Affidavits/declaration(s) <input type="checkbox"/> Extension of Time Request <input type="checkbox"/> Express Abandonment Request <input type="checkbox"/> Information Disclosure Statement <input type="checkbox"/> Certified Copy of Priority Document(s) <input type="checkbox"/> Response to Missing Parts/Incomplete Application <input type="checkbox"/> Response to Missing Parts under 37 CFR 1.52 or 1.53	<input type="checkbox"/> Assignment Papers (for an Application) <input type="checkbox"/> Drawing(s) <input type="checkbox"/> Licensing-related Papers <input type="checkbox"/> Petition Routing Slip (PTO/SB/69) and Accompanying Petition <input type="checkbox"/> To Convert a Provisional Application <input type="checkbox"/> Power of Attorney, Revocation Change of Correspondence Address <input type="checkbox"/> Terminal Disclaimer <input type="checkbox"/> Small Entity Statement <input type="checkbox"/> Request for Refund	<input type="checkbox"/> After Allowance Communication to Group <input type="checkbox"/> Appeal Communication to Board of Appeals and Interferences <input type="checkbox"/> Appeal Communication to Group (Appeal Notice, Brief, Reply Brief) <input type="checkbox"/> Proprietary Information <input type="checkbox"/> Status Letter <input checked="" type="checkbox"/> Additional Enclosure(s) (please identify below): <div style="border: 1px solid black; padding: 5px; margin-top: 5px;">           Postcard PTO/SB/06         </div>
<div style="border: 1px solid black; padding: 5px;">             Remarks           </div>		

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT	
Firm or Individual name	FULWIDER PATTON LEE & UTECHT, LLP ELLSWORTH R. ROSTON, ESQ., REG. NO. 16,310
Signature	<i>Ellsworth R. Roston</i>
Date	December 7, 1998

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Patent fees are subject to annual revision on October 1.

These are the fees effective October 1, 1997.

Small Entity payments must be supported by a small entity statement, otherwise large entity fees must be paid. See Forms PTO/SB/09-12. See 37 C.F.R. §§ 1.27 and 1.28.

TOTAL AMOUNT OF PAYMENT (\$) 200.00

**Complete if Known**

Application Number	08/797,188
Filing Date	February 11, 1998
First Named Inventor	PETER C. DeANGELIS
Examiner Name	J. Moore
Group / Art Unit	3301
Attorney Docket No.	ROKEN-40907

**METHOD OF PAYMENT (check one)**

- 1.
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- 2.
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Large Entity Code (\$)	Small Entity Code (\$)	Fee Description	Fee Paid
101 790	201 395	Utility filing fee	
106 330	206 165	Design filing fee	
107 540	207 270	Plant filing fee	
108 790	208 395	Reissue filing fee	
114 150	214 75	Provisional filing fee	
SUBTOTAL (1) (\$)			

**2. EXTRA CLAIM FEES**

Total Claims	Extra Claims	Fee from below	Fee Paid
Independent Claims	-20**	X	
Multiple Dependent Claims	-3**	X	

\*\*or number previously paid, if greater; For Reissues, see below

Large Entity Code (\$)	Small Entity Code (\$)	Fee Description	Fee Paid
103 22	203 11	Claims in excess of 20	
102 82	202 41	Independent claims in excess of 3	
104 270	204 135	Multiple dependent claim, if not paid	
109 82	209 41	** Reissue independent claims over original patent	
110 22	210 11	** Reissue claims in excess of 20 and over original patent	
SUBTOTAL (2) (\$)			

**FEE CALCULATION (continued)****3. ADDITIONAL FEES**

Large Entity Code (\$)	Small Entity Code (\$)	Fee Description	Fee Paid
105 130	205 65	Surcharge - late filing fee or oath	
127 50	227 25	Surcharge - late provisional filing fee or cover sheet	
139 130	139 130	Non-English specification	
147 2,520	147 2,520	For filing a request for reexamination	
112 920*	112 920*	Requesting publication of SIR prior to Examiner action	
113 1,840*	113 1,840*	Requesting publication of SIR after Examiner action	
115 110	215 55	Extension for reply within first month	
116 400	216 200	Extension for reply within second month	
117 950	217 475	Extension for reply within third month	
118 1,510	218 755	Extension for reply within fourth month	
128 2,060	228 1,030	Extension for reply within fifth month	
119 310	219 155	Notice of Appeal	
120 310	220 155	Filing a brief in support of an appeal	
121 270	221 135	Request for oral hearing	
138 1,510	138 1,510	Petition to institute a public use proceeding	
140 110	240 55	Petition to revive - unavoidable	
141 1,320	241 660	Petition to revive - unintentional	
142 1,320	242 660	Utility issue fee (or reissue)	
143 450	243 225	Design issue fee	
144 670	244 335	Plant issue fee	
122 130	122 130	Petitions to the Commissioner	
123 50	123 50	Petitions related to provisional applications	
126 240	126 240	Submission of Information Disclosure Stmt	
581 40	581 40	Recording each patent assignment per property (times number of properties)	
146 790	246 395	Filing a submission after final rejection (37 CFR 1.129(a))	
149 790	249 395	For each additional invention to be examined (37 CFR 1.129(b))	
Other fee (specify) <u>Amendment (Late Fee)</u>			200.00
Other fee (specify) _____			
SUBTOTAL (3) (\$)			200.00

\*Reduced by Basic Filing Fee Paid

**SUBMITTED BY**Typed or  
Printed Name Ellsworth R. Roston, Esq.

Signature

Ellsworth R. Roston

Date

12/7/98

**Complete (if applicable)**

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PATENT APPLICATION FEE DETERMINATION RECORD					Application or Docket Number <b>ROKEN-40907</b>	
CLAIMS AS FILED - PART I					SMALL ENTITY OR OTHER THAN SMALL ENTITY	
(Column 1)		(Column 2)				
FOR	NUMBER FILED	NUMBER EXTRA			RATE	FEE
BASIC FEE (37 CFR 1.16(a))					\$ _____	OR
TOTAL CLAIMS (37 CFR 1.16(c))	151	minus 20 =	*	131	x \$ _____ =	OR
INDEPENDENT CLAIMS (37 CFR 1.16(b))	51	minus 3 =	*	48	x _____ =	OR
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(d))					+ _____ =	OR
					TOTAL	OR TOTAL
* If the difference in column 1 is less than zero, enter "0" in column 2						
CLAIMS AS AMENDED - PART II					SMALL ENTITY OR OTHER THAN SMALL ENTITY	
(Column 1)		(Column 2)			(Column 3)	
AMENDMENT A		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	
	Total (37 CFR 1.16(c))	*	151	Minus	**	151 = 0
	Independent (37 CFR 1.16(b))	*	51	Minus	***	51 = 0
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(d))					
	TOTAL ADDIT. FEE					
AMENDMENT B		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	
	Total (37 CFR 1.16(c))	*	133	Minus	**	151 = 0
	Independent (37 CFR 1.16(b))	*	45	Minus	***	51 = 0
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(d))					
	TOTAL ADDIT. FEE					
AMENDMENT C		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	
	Total (37 CFR 1.16(c))	*	131	Minus	**	133 = 0
	Independent (37 CFR 1.16(b))	*	44	Minus	***	45 = 0
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(d))					
	TOTAL ADDIT. FEE					

\* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.  
 \*\* If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".  
 \*\*\* If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".  
 The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

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*PATENT*

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Ellsworth R. Roston  
Ellsworth R. Roston, Reg. No. 16,310

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of	)	Examiner: J. Moore
	)	
PETER C. DEANGELIS	)	Group Art Unit: 3301
	)	
Serial No: 08/797,188	)	Docket No. ROKEN-40907
	)	[#121297/v.1]
	)	
Filed: February 11, 1998	)	Date: December 7, 1998
	)	
For: SYSTEM AND METHOD FOR	)	Los Angeles, California
CONTROLLING THE	)	
OPERATION OF TOYS	)	

AMENDMENT

ASSISTANT COMMISSIONER FOR PATENTS  
Washington, D.C. 20231

Sir:

In response to the Office Action mailed July 8, 1998, please amend the  
above-identified application as follows:

**IN THE CLAIMS:**

Cancel claims 16, 17, 81, 136-145 and 150-151.

Claim 1 (amended): In combination for [with] use in a system including a plurality of vehicles each responsive to an individual address and to a plurality of commands for providing individual operations of such vehicles in accordance with such commands,

5 a plurality of pads, each individual one of the pads including a plurality of switches having first and second states of operation for providing an address to select any individual one of the vehicles and for providing commands to such individual one of the vehicles for operating such individual one of the vehicles in accordance with such commands,

10 a central station responsive to the [closure] operation of the switches in each individual one of the pads in the second state for sending the address and the commands from the individual one of the pads to the individual one of the vehicles,

15 there being an additional switch on each individual one of the pads with first and second states of operation, the additional switch in each individual one of the pads providing in the first state for the operation of the individual one of the vehicles only by [only] such individual one of the pads and providing in the second state for the operation of the individual one of the vehicles by at least another one of the pads in addition to the individual one of the pads, and

means in the central station for providing for the operation of the vehicle by the individual one of the pads and the at least additional one of the pads when the additional switch in the individual one of the pads is in the second state.

Claim 2 (amended): In a combination as set forth in claim 1,

each of the pads including, in the plurality of switches, first switches for controlling the movements of the individual one of the vehicles and including, in the plurality of switches, second switches for controlling other operations of the vehicles than the movements of the vehicles, and

means responsive in the central station to the operation of the first switches in the individual one of the pads for providing [controlled] movements of the individual one of the vehicles and responsive in the central station to the operation of the second switches in the individual one of the pads for providing [controlled] operations of the individual one of the vehicles other than the movements of such vehicle.

Claim 3 (amended): In a combination as set forth in claim 2,

means responsive in the central station to the operation of the additional one of the switches in the individual one of the pads in the second state and to the operation of the first switches in the individual one of the pads and the at least additional one of the pads for providing [controlled] movements of the individual one of the vehicles in accordance with the operation of the first switches in the individual one of the pads and the additional one of



10     the pads and responsive in the central station to the operation of the second switches in the individual one of the pads and the additional one of the pads for providing [controlled] operations of the individual one of the vehicles other than the movements of such vehicle in accordance with the operation of the second switches in the individual one of the pads and the additional one of the pads.

Claim 4 (amended): In combination in a central station for use with a plurality of pads and a plurality of vehicles wherein each of the pads includes a plurality of switches for controlling the operation of an individual one of the vehicles,

5     first means responsive in the central station to an operation [the closure] of first switches in the plurality in an individual one of the pads in a pattern for producing first signals providing an address identifying any individual one of the vehicles,

10     second means responsive in the central station to an operation [the closure] of second switches in the plurality in the individual one of the pads for producing second signals providing for an operation of the individual one of the vehicles in accordance with such switch operations [closures], and

third means responsive in the central station to the operation [closure] of a third switch in the plurality in the individual one of the pads for providing for an operation of the individual one of the vehicles by at least a second one of the pads simultaneously with the operation of the individual one of the vehicles by the individual one of the pads, [and]

15                   the at least second one of the pads having first and second switches respectively  
corresponding to the first and second switches in the individual one of the pads, and

                  fourth means in the central station for sending to the individual one of the vehicles  
the first signals providing, in the individual one of the pads and the at least second one of the  
pads, the address identifying the individual one of the vehicles and the second signals  
20 providing commands for obtaining the operation of the vehicle in accordance with the  
pattern of closure of the second switches in the individual one of the pads and in the at least  
additional one of the pads.

Claim 5 (amended): In a combination as set forth in claim 4,

                  the first means being responsive in the central station to the operation [closure] of  
the first switches in [a] the at least second one of the pads in the pattern for producing [third]  
in the at least second one of the pads third signals providing an address identifying the  
5 individual one of the vehicles at substantially the same time that the first signals are  
provided in the individual one of the pads to provide the address identifying the individual  
one of the vehicles,

                  the second means being responsive in the central station to the [closure] operation  
of the second switches in the at least additional [second] one of the pads for producing  
10 fourth signals providing for the operation of the individual one of the vehicles in accordance  
with such switch [closures] operations,

the fourth means being operative in the central station to send to the individual one of the vehicles from the at least additional [second] one of the pads, at substantially the same time as [simultaneously with] the sending to the individual one of the vehicles from the individual one of the pads, the third signals providing the address identifying the individual one of the vehicles and the fourth signals providing commands for obtaining the operation of the vehicle in accordance with the pattern of [closure] operation of the second switches in the second one of the pads.

Claim 6 (amended): In combination for controlling the operation of an individual one of a plurality of vehicles,

a [handheld] first pad included in a plurality of pads and including a first switch operable in a pattern providing an address of the individual one of the plurality of vehicles and including a plurality of switches individually operable in a pattern providing for operations of the individual one of the vehicles in accordance with the pattern of [closures] operations of such switches,

means in the [handheld] first pad for providing a plurality of light indications each for [an individual] a particular one of the vehicles in the plurality,

means in the [handheld] first pad for providing first light indications for the vehicles in the plurality when such [handheld] first pad has not provided an address for any of the vehicles in the plurality, and

means in the [handheld] first pad for providing a second illumination for the individual one of the vehicles when the [handheld] first pad provides the address for such individual one of the vehicles[.],

the first pad including an additional switch having first and second states of operation and operative in the first state to provide for (an) operation of the vehicle only by the pad and operative in the second state to provide for (an) operation of the vehicle (by other pads in the plurality in addition to the pad.

*individual one of the*  
*first*  
*individual one of the*  
*another one of the*  
*first*

Claim 7 (amended): In a combination as set forth in claim 6,

[there being a plurality of handheld pads,]

each of the [handheld] pads, other than the first pads, including a switch corresponding to the first switch in the first pad and sequentially operative to select successive ones of the vehicles in the plurality, and

means responsive in each of the [handheld] pads to the sequential operations of the switch in the pad for skipping the [selection] addressing by the [handheld] pad of a vehicle in the plurality which has [previously] already been addressed by another one of the pads in the plurality.

Claim 8, lines 4 and 5, change "handheld" to -first-.

Claim 9 (amended): In combination for operating a vehicle in accordance with addresses and commands provided by a pair of [handheld] pads and transmitted by a central station to the vehicle,

means in the vehicle for receiving the addresses and commands provided by the pads and transmitted by the central station,

means in the vehicle for identifying the [received] addresses received from the pads as those of the vehicle,

means responsive in the vehicle to the identification of the addresses received from the pads as those of the vehicle for executing the received commands from the [handheld] pads when the received commands from the pair of the pads are complementary, and

means responsive in the vehicle to the identification of the [received] addresses received from the pair of the pads as those of the vehicle for ignoring the [received] commands received from the [handheld] pads when the received commands are contradictory.

Claim 10 (amended): In a combination as set forth in claim 9,

means responsive in the vehicle to the discontinuance of one of the pads in the [plurality] pair in addressing the vehicle for continuing the response of the vehicle to the addresses and commands from the other one of the pads in the pair.

Claim 11 (amended): In combination for use in a system including a plurality of vehicles each responsive to an individual address and to a plurality of commands for providing individual operations of such vehicle in accordance with such commands,

5 a plurality of pads each operative to provide an address for selecting any individual one of the vehicles and to provide commands to such individual one of the vehicles for operating such individual one of the vehicles in accordance with such commands,

10 a central station connected to individual ones of the pads and responsive to the address and the commands from each of the connected pads for sending the address and the commands from such pad to the vehicle selected by such pad to obtain an operation of such vehicle in accordance with such commands, [and]

15 each of the pads including a switch having first and second states of operation and operative in the first state to provide an operation of an individual one of the vehicles in the plurality only by such pad and operative in the second state to provide for the operation of such individual one of the vehicles simultaneously by such pad and at least another one of the pads, and

means in the central station for obtaining the interrogation at each instant of only the individual ones of the pads in the plurality that are connected to the central station [providing addresses and commands to obtain the operation of vehicles in the plurality].

Claim 12 (amended): In a combination as set forth in claim 11,

means in the central station for transmitting the addresses and commands from the interrogated pads to the vehicles in the plurality to obtain the operation, in accordance with such commands, of the vehicles addressed by the central station [on the cyclic basis].

Claim 13 (amended): In a combination as set forth in claim 12,

[each of the pads including a switch having first and second states of operation and operative in the first state to provide an operation of an individual one of the vehicles in the plurality only by such pad and operative in the second state to provide for the operation of such individual one of the vehicles simultaneously by such pad and another one of the pads.]

the central station being operative to send to the vehicles only changes in the addresses and commands from the pads relative to the addresses and commands previously sent by the pads to the vehicles.

Claim 18 (amended): In combination,

a plurality of vehicles,

a plurality of pads, each individual one of the pads including a plurality of switches having [open] first and [closed] second states of operation for providing an address to select any individual one of the vehicles and for providing commands to such individual

one of the vehicles for operating such individual one of the vehicles in accordance with such commands,

a central station responsive to the [closure] operation of the switches in the first state in such individual one of the pads for sending the commands to the individual one of the vehicles addressed by such individual one of the pads,

first means including a memory in the central station for storing in the memory the identity of the individual one of the vehicles last addressed by such individual one of the pads, and

[second means] an additional switch disposed in the <sup>pad</sup>(central station) and having first and second states of operation for providing for the selection again, in the second state of operation of the additional switch, by such individual one of the pads of the individual one of the vehicles stored in the memory for such individual one of the pads after such individual one of the pads has selected any one of the vehicles other than the individual one of the vehicles or after the individual one of the pads has failed to provide a command to the individual one of the vehicles for a particular period of time.

Claim 19 (amended): In a combination as set forth in claim 18,

each of the pads including a particular switch having [open] first and [closed] second states of operation and operable to the [closed] second state on a repetitive basis for a particular number of times to select [the] any individual one of the vehicles, each of the pads including [additional] further switches having [open] first and [closed] second states and



operable to the [closed] second state to provide the commands for operating the individual one of the vehicles, and

[the] second means responsive in the central station [being responsive] to the operation of the additional switch in the individual one of the pads in the second state and to the operation of any one of the [additional] further switches in the individual one of the pads to the [closed] second state, after such individual one of the pads has selected one of the vehicles other than the individual one of the vehicles or after the individual one of the pads has failed to provide a command to the individual one of the vehicles for a particular period of time, for providing for the [selection] addressing again by such individual one of the pads of such individual one of the vehicles.

Claim 20 (amended): In combination for use with a central station and a plurality of vehicles for selecting and operating individual ones of the vehicles in accordance with addresses and commands provided by the central station,

a [hand held] pad in a plurality of pads,

a first switch in the pad, the first switch having first [open] and [closed] second states and operable on a repetitive basis to the [closed] second state for a particular number of times to select an individual one of the vehicles to be addressed by the central station,

a plurality of additional switches in the pad, the additional switches having [open] first and [closed] second states and [being] operable to the [closed] second state in a

particular pattern to obtain the operation of the individual one of the vehicles in accordance with the pattern of [closure] operation of the additional switches in the second state,

a plurality of light indications in the pad, each of the light indications being associated with a different one of the vehicles in the plurality,

means for energizing the light indications in sequence (on a cyclic basis) before any [closures] operations of the first switch in the pad to the second state to select the individual one of the vehicles in the plurality, [and]

means for continuously energizing the individual one of the light indications associated with the individual one of the vehicles when the first switch in the pad has been operated to the second [closed] state on the repetitive basis for the particular number of

times to select the individual one of the vehicles to be addressed by the central station[.], and ]

means for skipping the energizing of the light indications associated with the vehicles addressed by the pads in the plurality other than the pad when the first switch in the pad is operated on the repetitive basis to address the individual one of the vehicles, and

*means in the pad for providing for the addressing of the individual one of the vehicles by another one of the pads in the plurality in addition to the addressing of the individual one of the vehicles by the pad.*

Claim 21 (amended): In a combination as set forth in claim 20,

means in the pad for providing for the addressing of the individual one of the vehicles by another pad in the plurality in addition to the addressing of the individual one of the vehicles by the pad.

[the pad constituting a first pad,

there being a plurality of additional pads each having the same construction as the first pad, and

means for skipping the light indications in the first pad of the vehicles selected by the additional pads when the first switch in the first pad is operated to the closed state on the repetitive basis.]

Claim 22 (amended): In a combination as set forth in claim 20,

means for sending to the central station a first plurality of binary indications representing the repetitive operation of the first switch in the pad to the [closed] second state to provide an address by the central station for the individual one of the vehicles in the plurality and for sending to the central station a second plurality of binary indications representing the pattern of [closure] operation of the additional switches in the pad to the second state to provide the commands by the central station for operating the individual one of the vehicles.

Claim 23 (amended): In combination for use in a system including a plurality of vehicles each responsive to an individual address and to a plurality of commands for providing individual operations of the vehicles in accordance with such commands,

a plurality of pads each operative to provide an address for selecting any individual one of the vehicles and to provide commands to such individual one of the

vehicles for operating such individual one of the vehicles in accordance with such commands,

a central station, [connected to the pads,] the pads being connected to the central station,

10 first means in the central station for interrogating the pads to determine the address and the commands provided by such pads,

second means responsive in the central station to the interrogation provided by the first means in the central station concerning the address and the commands from each pad for sending the address and the commands from such pad to the vehicle addressed by such pad to obtain an operation of such vehicle in accordance with such commands,

15 the first means in the central station being operative to interrogate any additional pad connected to the central station at the instant that such additional pad is connected to the central station, and

20 the second means being responsive in the central station to the interrogation provided [on the cyclic basis] by the first means in the central station concerning the address and the commands from the pads in the plurality and from the additional pad for sending signals representing the address and the commands from each such pad to the vehicle addressed by such pad, instantaneously after the additional pad is connected to the central station, to obtain an operation of such vehicle in accordance with such commands without

25 affecting the interrogation of the pads in the plurality by the central station.

Claim 24 (amended): In a combination as set forth in claim 23,

third means in the central station for providing for the sending [transmitting] at each instant by the second means of only the commands from the pads which are providing changes in addresses or commands at that instant.

Claim 25 (amended): In a combination as set forth in claim 23,

the first means being operative to eliminate from interrogation by the central station any one of the pads disconnected in the plurality from the central station and to provide such elimination at the instant that the pad is disconnected from the central station and without affecting the interrogation of the other pads by the central station and to provide for the addressing by any of the pads, other than the disconnected pad, of the vehicle previously addressed by the disconnected pad.

Claim 26 (amended): In combination for use in a system including a plurality of

vehicles each responsive to an individual address and to a plurality of commands for providing individual operations of the vehicles in accordance with such commands,

a plurality of pads each operative to provide an address for selecting any individual one of the vehicles and to provide commands to such individual one of the vehicles for operating such individual one of the vehicles in accordance with such commands,

a central station [connected to the pads], the pads being connected to the central station,

10 first means in the central station for interrogating the pads to determine the address and the commands provided by such pads,

second means responsive in the central station to the interrogation provided by the first means in the central station concerning the address and the commands from each pad for sending signals representing the address and the commands from such pad to the vehicle  
15 addressed by such pad to obtain an operation of such vehicle in accordance with such commands,

the first means in the central station being operative to eliminate, from the interrogation, any one of the pads disconnected in the plurality from the central station and to provide such elimination at the instant that the pad is disconnected from the central station  
20 and to provide such elimination without affecting the interrogation of the other pads by the central station and to provide for an addressing by any pad, other than the disconnected pad, of the vehicle previously addressed by the disconnected pad,

the second means being responsive in the central station to the interrogation provided by the first means in the central station concerning the address and the commands  
25 from each of the pads interrogated by the central station for sending the signals representing the address and the commands from each such pad to the vehicle addressed by such pad to obtain an operation of such vehicle in accordance with such commands.

Claim 27 (amended): In a combination as set forth in claim 26,

third means in the central station for [transmitting] providing for the transmission at each instant by the second means only of the commands from the pads which are providing changes in addresses or commands at that instant.

Claim 28 (amended): In combination for use in a system including a plurality of vehicles each responsive to an individual address and to a plurality of commands for providing individual operations of the vehicles in accordance with such commands,

a plurality of pads each including a first switch having [open] first and [closed] second states and operative to provide an address to any individual one of the vehicles dependent upon the number of the operations of such switch [closures] in the second state and including [a plurality of] second switches each having [open] first and [closed] second states and operative in the [closed] second state to provide a particular operation of the individual one of the vehicles,

a central station responsive to the [closures] operation of the first switch in each of the pads in the second state for providing an address to any individual one of the vehicles dependent upon the number of operations of such first switch [closures] in such pad in the second state and responsive to the [closures] operations of the second switches in such pad in the second state for providing signals representing operations to be performed by such individual one of the vehicles, and

means responsive in the central station to the [closures] operations in the second state of [individual pairs of] the second switches providing in [each] a pair of the pads contradictory commands to the individual one of the vehicles for converting such contradictory commands to signals providing specialized commands different from the commands provided by the [closure] operation of the different ones of the second switches in such pads.

Claim 29 (amended): In a combination as set forth in claim 28,

means in the central station for providing at each instant only the commands from the pads which are providing changes in addresses or commands at that instant, and

means in the central station for sending to the vehicles in the plurality the commands provided by the last mentioned means in the central station.

Claim 30 (amended): In combination for use with a plurality of [hand held] pads each [manually] operable to provide signals representing addresses and commands,

a central station responsive to the addresses and commands from the [hand held] pads for providing for each of the pads a first plurality of signals representing the address of any individual one of the vehicles and a second plurality of signals representing the commands for operating such individual one of the vehicles, the first and second pluralities of signals provided at the central station for each of the pads occurring at a particular rate selected in a particular range of rates,



the central station also providing a plurality of start signals at the particular rate,  
10 a plurality of vehicles each having an individual address and each including first means responsive to the signals representing the individual address for such vehicle and responsive to the second signals providing the commands for such vehicle for operating such vehicle in accordance with such commands, and

15 means responsive in each of the vehicles to the start signals from the central station for determining the particular rate of occurrence of the start signals and for providing for the response of the first means in the vehicle, at the particular rate of occurrence of the start signals, to the <sup>start</sup> signals representing the individual address of [each] the vehicle and to the second signals providing the commands for such vehicle.

Claim 32 (amended): In a combination as set forth in claim 30,

the central station being operative in a first mode to provide for the addressing of each individual one of the vehicles by only one of the pads in the plurality and being operative in a second mode to provide for the addressing of each individual one of the  
5 vehicles by at least two (2) of the pads in the plurality.

Claim 33 (amended): In combination,

a plurality of vehicles,

a plurality of [hand held] pads each including a first switch having [open] first and

[closed] second states and operable in the [closed] second state to [select] address any

5 individual one of the vehicles dependent upon the number of [closures] operations of the first switch in the second state and each including a plurality of second switches each having [open] first and [closed] second states, the second switches for each of the pads being operable in the [closed] second state in a pattern providing an operation of the selected vehicle dependent upon such switch [closures] operations in the second state,

10 a central station,

first means in the central station for interrogating the pads in the plurality to determine the number of [closures] operations of the first switch in the second state for each of the pads and the pattern of [closures] operations of the second switches in the second state for each of the pads,

15 second means in the central station for providing, for each of the pads, a first plurality of signals providing an address of any one of the vehicles dependent upon the number of [closures] operations of the first switch in such pad in the second state and a second plurality of signals providing commands dependent upon the pattern of [closure] operation of the second switches in such pad in the second state, the first and second signals  
20 for each of the pads occurring at a particular rate,

third means in the central station for providing a plurality of start signals at the particular rate,

fourth means responsive in each of the vehicles to the start signals at the particular rate for operating upon the first plurality of signals in each of the pads at the particular rate  
25 to identify the address individual to such vehicle and for operating upon the second plurality

of signals at the particular rate to identify the commands related to the address individual to such vehicle, and

fifth means for operating each vehicle in accordance with the commands provided for such vehicle.

Claim 34 (amended): In a combination as set forth in claim 33,

sixth means associated in the central station with the [fifth] second means for [transmitting] providing for the transmittal to the vehicles by the second means at each instant only of the signals representing changes in addresses or commands from the pads at that instant.

Claim 35 (amended): In a combination as set forth in claim 33,

each of the pads including an additional switch having first and second states of operation and providing in the first state of operation for the addressing by such pad of one of the vehicles not addressed at that time by any of the other pads and providing in the second state of operation for the addressing of the one of the vehicles by the pad and by [addressed at that time by] at least another one of the pads.

Claim 36 (amended): In combination for use with a plurality of vehicles,

a plurality of pads each operative to [identify] address any individual one of the vehicles [addressed by such pad] and to provide a plurality of binary indications providing

commands for operating the [individual one of the] addressed vehicle[s identified by such  
5 address],

a central station,

first means operatively coupled in the central station to the pads in the plurality  
for providing packets of signals identifying for each pad the individual one of the vehicles  
addressed by such pad and the commands for operating the individual one of the vehicles,  
10 and

second means responsive in each vehicle to the same identity of the signals  
providing the commands in two (2) successive packets addressed to such vehicle by the first  
means in the central station for operating such vehicle in accordance with the pattern of the  
signals in such packets.

15 Claim 37 (amended): In a combination as set forth in claim 36,

means in the central station for interrogating the pads on a cyclic basis to obtain  
binary indications from each of the pads, on the cyclic basis with the other pads, of the  
individual one of the vehicles addressed by such pad and the binary indications providing  
commands for operating the individual one of the vehicles addressed by such pad.

Claim 38 (amended): In a combination as set forth in claim 36,

means in the central station for transmitting to the vehicles at each instant only the binary indications from [th epads] the pads which are providing changes in addresses or commands at that instant.

Claim 40 (amended): In combination for use in a vehicle for moving the vehicle in accordance with commands which are provided by a [handheld] pad to control the movements of the vehicle and which are converted by a central station to commands addressed by the central station to the vehicle to obtain the movements of the vehicle,

5 a pair of left wheels in the vehicle, the left wheels being spaced from each other in a longitudinal direction,

a pair of right wheels in the vehicle, the right wheels having the same spacing in the vehicle in the longitudinal direction as the left wheels,

10 first means in the vehicle for receiving the commands addressed to the vehicle from the central station,

a first motor in the vehicle for moving the left wheels in the vehicle in the longitudinal direction,

a second motor in the vehicle for moving the right wheels in the vehicle in the longitudinal direction,

15 the commands addressed to the vehicle from the central station including first signals for operating the first motor and second signals for operating the second motor,

second means responsive in the vehicle to the first and second signals received by the vehicle from the central station for [normally] accelerating the first and second motors in progressive increments to the speeds commanded by the central station to such motors for movement of the vehicle in the longitudinal direction, and

third means responsive in the vehicle to the first and second signals received by the vehicle from the central station for operating the first and second motors at the same speed, without any progressive increments in speed, for movement of the vehicle in the longitudinal direction[,] when one of the motors has been previously operated at a different speed than the other motor, the same speed constituting the higher of the speeds provided by the first and second motors.

Claim 41 (amended): In a combination as recited in claim 40,

fourth means responsive in the vehicle to the first and second signals received by the vehicle from the central station for converting the first and second signals to pulse width modulations in progressive periods of time, the pulse width modulations for each of the first and second motors at each instant [being] having duty cycles dependent upon the speed at which such motor is to be operated at that instant,

the operation of the second and third means at each instant being dependent upon such pulse width modulations at that instant and the duty cycles of such pulse width modulations at that instant.

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✓ See amendment under  
Rule 116 dated 7/12/99 for words  
PATENT

Claim 43 (amended): In combination for use in a vehicle for moving the vehicle *or*

in accordance with commands which are provided by a [handheld] pad to control the *clear*  
movements of the vehicle and which are converted by a central station to commands *and*  
addressed by the central station to the vehicle to obtain the movements of the vehicle, *add*

5 a pair of left wheels in the vehicle, the left wheels being spaced from each other in *first means at the end of the clear*  
a longitudinal direction,

a pair of right wheels in the vehicle, the right wheels having the same spacing in  
the longitudinal direction as the left wheels,

a first motor in the vehicle for moving the left wheels in the vehicle in the  
10 longitudinal direction,

a second motor in the vehicle for moving the right wheels in the vehicle in the  
longitudinal direction,

the commands addressed to the vehicle from the central station including first  
signals for operating the first motor and second signals for operating the second motor,

15 first means in the vehicle for receiving the commands addressed to the vehicle  
from the central station,

second means responsive in the vehicle to the first and second signals received by  
the vehicle from the central station for operating the first and second motors in accordance  
with such signals, (and)

20 third means responsive in the vehicle to the failure of the vehicle to receive the  
first and second signals for a particular period of time for maintaining the same operation of

the first and second motors for such particular period of time as the operation of the motors  
upon the last reception by the vehicle of the first and second signals from the central station, and

Claim 44 (amended): In a combination as set forth in [Exhibit] claim 43,

(fourth) means responsive in the vehicle to the first and second signals received by

the vehicle from the central station for [normally] accelerating the first and second motors in  
progressive increments to the speeds commanded by the central station to such motors for  
movement of the vehicle in the longitudinal direction,

Claim 45 (amended): (In a combination as set first in [Exhibit] claim 43,

(fourth) means responsive in the vehicle to the first and second signals received by

the vehicle from the central station for operating the first and second motors in accordance  
with such first and second signals only when the first means [receiver] has received the same  
first and second signals from the central station a plurality of successive times.

Claim 46 (amended): In combination,

a plurality of [hand held] pads,

a plurality of vehicles,

each of the [handheld] pads providing first binary indications representing [a

selection] an address of any individual one of the vehicles and second binary indications  
representing individual operations to be provided by such vehicle,



a central station responsive to the first and second binary indications from the different pads [on a cyclic basis] for producing for each of the pads first signals providing an individual address for the individual one of the vehicles [selected] addressed by such pad and second signals providing commands for moving such vehicle in a particular direction and for operating such vehicle,

means responsive in each of the vehicles to the first signals addressing such vehicle from the central station and to the second signals from the central station for such vehicle for moving such vehicle and operating such vehicle in accordance with the commands provided by the central station to such vehicle, *(and)*

means operative in each of the vehicles for continuing to provide a movement of such vehicle for a particular period of time in accordance with the last commands addressed to such vehicle by the central station when the vehicle fails to receive any commands addressed to such vehicle during such particular period of time.

*each of the vehicles being operative in a powered and active state and in a powered but inactive state, means operative in each of the vehicles for converting the vehicle from the powered and active state to the powered and inactive state at the end of the particular period of time (A)*  
 Claim 47 (amended): In a combination as set forth in claim 46,

*change in*  
 means in each of the vehicles for providing for *(an operation of)* such vehicle *from* *to a de-powered state* *passive* *from the central station for any of the pads* *passive*  
*if the* ~~an~~ inactive but powered state at the end of the particular period of time when such vehicle fails to receive any commands addressed to such vehicle during such particular period of time.

*(A) when such vehicle fails to receive any commands addressed to such vehicle during such particular period of time.*

Claim 48 (amended): In a combination as set forth in claim 46,  
means responsive in each of the vehicles to the commands addressed to the  
vehicle relating to movements of the vehicle at a particular speed for accelerating the vehicle  
in progressive increments to the particular speed [to obtain such movements].

Claim 49 (amended): In combination,  
a plurality of [hand held] pads,  
a plurality of vehicles,  
each of the [handheld] pads providing first binary indications representing a  
5 selection of any individual one of the vehicles and second binary indications representing  
individual operations to be provided by such vehicle,  
a central station responsive to the first and second binary indications from the  
different pads [on a cyclic basis] for producing for each of the pads first signals providing an  
individual address for [the] any individual one of the vehicles selected by such pad, the pads  
10 being connected to the central station,

each of the vehicles including a pair of left wheels spaced from each other in a  
longitudinal direction and a pair of right wheels spaced from each other in the longitudinal  
direction and including a first motor for moving the left wheels and a second motor for  
moving the right wheels,

15 the commands addressed to the vehicle from the central station including second  
signals for operating the first motor and third signals for operating the second motor,

first means in each of the vehicles for receiving the first, second and third signals addressed to such vehicle from the central station (and)

second means responsive in each of the vehicles to the second and third signals received by the vehicle from the central station for [normally] accelerating the first and second motors in progressive increments to the speeds commanded by the central station to such motors for movement of such vehicle in the longitudinal direction, and

third means responsive in each of the vehicles to the second and third signals received by such vehicle from the central station for movement of such vehicle in the longitudinal direction for operating the first and second motors at the same speed, without any movement in speed, when one of the (A)

Claim 51 (amended): In a combination as set forth in claim [49] 50, means operative in each of the vehicles for continuing to operate the first and second motors for a particular period of time in accordance with the last ones of the second and third signals received by such vehicle from the central station when such vehicle fails to receive the second and third signals addressed to such vehicle during such particular period of time.

Claim 52 (amended): In combination,

a plurality of [hand held] pads,

a plurality of vehicles,

each of the [hand held] pads providing first binary indications representing a

selection of any individual one of the vehicles and second binary indications representing individual operations to be provided by such vehicles,

(A) motor in such vehicle has been previously operated at a different speed than the other motor in such vehicle, the same speed constituting the higher of the speeds provided by the first and second motor in such vehicle.

a central station responsive to the first and second binary indications from the different pads [on a cyclic basis] for producing for each of the pads first signals providing an individual address for [the] any individual one of the vehicles selected by such pad and  
10 second signals providing commands for moving such vehicle in a particular direction and for operating such vehicle,

first means in each of the vehicles for receiving the first and second signals from each of the pads,

second means responsive in each of the vehicles to the second signals addressed  
15 to such vehicle for determining whether successive ones of the second signals addressed to such vehicle [on the cyclic basis] are identical, and

third means in each of the vehicles for operating such vehicle in accordance with the second signals addressed to such vehicle when the second means in such vehicle determines that the successive ones of the second signals addressed to such vehicle [on the  
20 cyclic basis] are identical.

Claim 53 (amended): In a combination as set forth in claim 52,

the third means in each of the vehicles being operative to operate such vehicle in accordance with the second signals addressed to such vehicle in the second of the successive ones of the second signals addressed to such vehicle [on the cyclic basis] when the second  
5 means in such vehicle determines that the successive ones of the second signals addressed to such vehicle [on the cyclic basis] are identical.

Claim 54 (amended): In a combination as set forth in claim 52,

the first and second signals for each of the vehicles being in the form of packets each having a first particular number of the first signals and a second particular number of the second signals,

5 fourth means for determining whether at least a particular percentage of the *successive*  
6 packets addressed to each of the vehicles has the first particular number of the first signals  
7 and the second particular number of the second signals in such packets during a particular  
8 period of time, and

15 9 fifth means for operating each of the vehicles in accordance with the second  
10 signals in the packets addressed to such vehicle when the fourth means in such vehicle  
11 determines that at least the particular percentage of the *successive* packets addressed to such vehicle  
12 during the particular period of time has the first particular number of the first signals and the  
13 second particular number of the second signals in the packets [during the particular period of  
14 time].

Claim 55 (amended): In combination,

a plurality of [hand held] pads,

a plurality of vehicles,

each of the [hand held] pads providing first binary indications representing [a

5 selection] an addressing of any individual one of the vehicles and second binary indications representing individual operations to be provided by such addressed vehicle[s],

a central station responsive to the first and second binary indications from the different pads [on a cyclic basis] for producing for each of the pads [on the cyclic basis] first signals providing an individual address for [the] any individual one of the vehicles selected by such pad and second signals providing commands for moving such vehicle in a particular direction and for operating such vehicle,

first means in each of the vehicles for receiving the first and second signals from each of the pads,

the first and second signals for each of the vehicles being in the form of packets each having a first particular number of the first signals and a second particular number [member] of the second signals,

second means for determining whether at least a particular percentage of the <sup>successive</sup> packets addressed to each of the vehicles during a particular period of time has the first particular number of the second signals in each packet [during a particular period of time], and

third means for operating each of the vehicles in accordance with the second signals in the <sup>successive</sup> packets addressed to such vehicle when the [fourth] second means in each vehicle determines that at least the particular percentage of the packets addressed to such vehicle during the particular period of time has the second particular number of the second signals in the packets [during the particular period of time].

Claim 56 (amended): In a combination as set forth in claim 55,

the central station being operative to interrogate

each of the pads [on the cyclic basis] to determine the first and second binary indications from such pad[s], and

5 means in the central station for sending to the vehicles at each instant only the [second] binary indications representing changes in the addresses or commands from the pads at that instant.

Claim 57 (amended): In combination in a vehicle for use [in] with a central station operative to receive, from a plurality of pads [on a cyclic basis], first binary

indications representing the address of the vehicle and second binary indications representing operations to be performed by the vehicle and operative to send to the vehicle

5 first signals in accordance with the first binary indications and second signals in accordance with the second binary indications,

first means in the vehicle for receiving the first and second signals from the central station [on the cyclic basis] for each of the pads,

10 second means in the vehicle for determining whether successive ones of the second signals addressed to such vehicle [on the cyclic basis] are identical, and

third means in each of the vehicles for operating such vehicle in accordance with the second signals addressed to such vehicle when the second means in such vehicle

determines that the successive ones of the second signals addressed to such vehicle <sup>on the</sup> cyclic basis are identical.

Claim 58 (amended): In a combination as set forth in claim 57 wherein

the successive ones of the second signals are addressed to the vehicle on a cyclic basis and wherein

the third means in each of the vehicles is operative to operate such vehicle in accordance with the [successive] second ones of the second signals addressed to such vehicle <sup>on the cyclic basis</sup> [on the cyclic basis] when the second means in such vehicle determines that the successive ones of the second signals addressed to such vehicle [on the cyclic basis] are identical.

Claim 59 (amended): In a combination as set forth in claim 5[8]Z, including,

fourth means responsive to first ones of the second signals addressed to such vehicle [on the cyclic basis] for moving the vehicle, and

fifth means responsive to second ones of the second signals addressed to such vehicle [on the cyclic basis] for providing operations of the vehicle other than moving the vehicle.



Claim 60 (amended): In a combination as set forth in claim 5[9]Z,

the first and second signals for the vehicle being in the form of packets each having a first particular number of the first signals and a second particular number of the second signals,

5 sixth means for determining whether at least a particular percentage of the packets addressed to the vehicle during a particular period of time has the second particular number of the second signals in such packets [during a particular period of time], and

seventh means for operating the vehicle in accordance with the second signals in the packets addressed to such vehicle when the sixth means in such vehicle determines that  
10 at least the particular percentage of the packets addressed to such vehicle during the particular period of time has [at least] the second particular number of the second signals in the packets[, during the particular period of time].

Claim 61 (amended): In combination in a vehicle for use with a central station operative to receive, from a plurality of pads [on a cyclic basis], first binary indications representing the address of the vehicle and second binary indications representing operations to be performed by the vehicle and for sending first signals in accordance with the first  
5 binary indications and second signals in accordance with the second binary indications,

first means in the vehicle for receiving the first and second signals from the central station in representation of the binary indications from each of the pads,

the first and second signals for the vehicle being in the form of packets each having a first particular number of the first signals and a second particular number of the second signals,

second means in the vehicle for determining whether at least a particular percentage of the <sup>successive</sup> packets addressed to the vehicle during a particular period of time has the second particular number of the second signals in such packets [during a particular period of time], and

third means in the vehicle for operating the vehicle in accordance with the second signals in the packets addressed to such vehicle when the second means in such vehicle determines that at least the particular percentage of the packets addressed to such vehicle during the particular period of time has the second particular number of the second signals in the packets [during the particular period of time].

Claim 63 (amended): In combination for use in a system including a central station and a plurality of vehicles and a plurality of pads each [manually] operable to provide first binary indications providing an address to any individual one of the vehicles and second binary indications providing commands for operating the individual one of the vehicles and each operable to provide the first and second binary indications to the central station for the transmission by the central station to the vehicles of signals indicating the first and second binary indications from each of the pads,

a microcontroller in the central station,

10 a first line extending between the microcontroller and the pads in the plurality to provide an interrogation by the central station of such pads [of] with respect to the first and second binary indications from such pads,

15 a second plurality of lines each extending between the microcontroller and an individual one of the pads for providing clock signals from the central station to the individual one of the pads for controlling the time of the interrogation of such individual one of the pads by the central station, and

a third plurality of [third] lines each extending between the microcontroller and an individual one of the pads for providing the first and second binary indications from the individual one of the pads to the central station in response to the interrogation by the central station to the individual one of the pads.

Claim 64 (amended): In a combination as set forth in claim 63,

the [second] lines in the second plurality introducing the clock signals in sequence to the different ones of the pads on a cyclic basis to obtain an interrogation of the pads by the central station when the pads receive the clock signals, and

5 the [third] lines in the third plurality providing the first and second binary indications from the pads to the central station when the pads are interrogated by the central station.

Claim 65 (amended): In a combination as set forth in claim 63,

the [second] lines in the second plurality introducing the clock signals

simultaneously to the different ones of the pads to obtain a simultaneous interrogation of the different pads by the central station, and

5 the [third] lines in the third plurality providing the first and second binary indications from the pads when the pads are interrogated by the central station.

Claim 66 (amended): In a combination as set forth in claim 63,

the clock signals having first and second polarities,

the interrogation of the pads in the plurality by the central station occurring when

5 the clock signals on the [second] lines in the second plurality have a particular one of the first and second polarities.

Claim 67 (amended): In combination for use in a system including a central

station and a plurality of vehicles and a plurality of pads each [manually] operable to provide first binary indications providing an address to any individual one of the vehicles and second binary indications providing commands for operating the individual one of the vehicles and  
5 each operable to provide the first and second binary indications to the central station for the transmission by the central station to the vehicles of the first and second binary indications from each of the pads,

10 a first line extending between the central station and the pads in the plurality to provide an interrogation of such pads by the central station of the first and second binary indications from such pads,

a second plurality of lines each extending between the central station and an individual one of the pads for providing clock signals from the central station to the individual one of the pads for controlling the time of the interrogation of such individual one of the pads by the central station, and

15 a third plurality of [third] lines each extending between the central station and an individual one of the pads for providing the first and second binary indications from the individual one of the pads to the central station in response to the interrogation by the central station to the individual one of the pads,

20 the [third] lines in the third plurality also providing binary indications from the central station to each individual one of the pads in the plurality, after the provision of the first and second binary indications from such individual one of the pads to the central station, of the particular one of the vehicles addressed by each individual one of the pads.

Claim 68 (amended): In a combination as set forth in claim 67,

the [second] lines in the second plurality introducing the clock signals in sequence to the different ones of the pads on a cyclic basis to obtain an interrogation of the pads by the central station when the pads receive the clock signals, and

5           the [third] lines in the third plurality providing the first and second binary indications from the pads to the central station when the pads are interrogated by the central station,

          each of the pads having a plurality of lights each indicating a different one of the vehicles, and

10           means for illuminating a particular one of the lights on each of the pads in accordance with the particular one of the vehicles addressed by such pad.

Claim 69 (amended): In a combination as set forth in claim 67,

          the [second] lines in the second plurality introducing the clock signals simultaneously to the different ones of the pads to obtain a simultaneous interrogation of the different pads by the central station, and

5           the [third] lines in the third plurality providing the first and second binary indications from the pads when the pads are interrogated by the central station,

          each of the pads having a plurality of lights each indicating a different one of the vehicles, and

          means for illuminating a particular one of the lights on each of the pads in  
10           accordance with the particular one of the vehicles addressed by such pad.

Claim 70 (amended): In a combination as set forth in claim 6[3]9,

the clock signals having first and second polarities,

the interrogation of the pads in the plurality by the central station occurring when the clock signals on the [second] lines in the second plurality have a particular one of the first and second polarities,

the illumination of the particular one of the lights on each of the pads by the indications from the central station to such pad through the [third] lines in the third plurality for such pad in representation of the particular one of the vehicles addressed by such pad occurring when the clock signals on the [second] lines in the second plurality have the other one of the first and second polarities.

Claim 71 (amended): In combination for use in a system including a central station and a plurality of vehicles and a plurality of pads each [manually] operable to provide first binary indications providing an address to any individual one of the vehicles and second binary indications providing commands for operating the individual one of the vehicles and each operable to provide the first and second binary indications to the central station for the transmission by the central station to the vehicles of signals representing the first and second binary indications from each of the pads,

a first line extending between the central station and the pads in the plurality to provide an interrogation by the central station of such pads [of] with respect to the first and second binary indications from such pads,

a plurality of second lines each extending between the central station and an individual one of the pads for providing clock signals from the central station to the individual one of the pads for controlling the time of interrogation of the individual one of the pads by the central station, and

15 a plurality of third lines each providing an indication from the central station to the individual one of the pads of the vehicle addressed by such individual one of the pads.

Claim 73 (amended): In a combination as set forth in claim 72,

the second lines introducing the clock signals in sequence to the different ones of the pads on a cyclic basis to obtain an interrogation of the pads by the central station when the pads receive the clock signals, and

5 the third lines providing in sequence the [first and second binary] indications from the central station to the individual ones of the pads of the vehicles addressed by such individual ones of the pads when the pads are interrogated by the central station [pads to the central station when the pads are interrogated by the central station].

Claim 74 (amended): In a combination as set forth in claim 7[3]1,

a plurality of lights in each of the pads, each of such lights providing an indication, when illuminated, of an individual one of the vehicles, and



\_\_\_\_\_ means for illuminating an individual one of the lights in each of the pads in  
5 accordance with the indication from the central station to such pad of the vehicle addressed  
by such pad.

Claim 75 (amended): In a combination as set forth in claim 72,

the second lines introducing the clock signals simultaneously to the different ones  
of the pads to obtain a simultaneous interrogation of the different pads by the central station,  
and

5 the third lines providing the first and second binary indications simultaneously  
from the central station to the individual ones of the pads of the vehicles addressed by such  
individual ones of the pads [from the pads] when the pads are interrogated by the central  
station.

Claim 76 (amended): In combination for use in a system including a central  
station and a plurality of vehicles and a plurality of pads each [manually] operable to provide  
first binary indications providing an address to any individual one of the vehicles and second  
binary indications providing commands for operating the individual one of the vehicles and  
5 each operable to provide the first and second binary indications to the central station for the  
transmission by the central station to the vehicles of signals representing the first and second  
binary indications from each of the pads,

10 a first line extending between the central station and the pads in the plurality to provide an interrogation of such pads of the first and second binary indications from such pads,

a plurality of second lines each extending between the central station and an individual one of the pads for providing clock signals to the individual one of the pads for controlling the time of the interrogation of such individual one of the pads by the central station, and

15 a plurality of third lines each extending between the central station and an individual one of the pads for providing the first and second binary indications from the individual one of the pads to the central station in response to the interrogation by the central station to the individual one of the pads,

20 the extension of the third lines between the central station and the pads providing for the decoupling of any one of the pads from the central station without affecting the provision of the first and second binary indications from the other ones of the pads to the central station.

Claim 77 (amended): In a combination as set forth in claim 76,

each of the third lines providing an indication from the central station to the individual one of the pads of the vehicle addressed by such individual one of the pads,

5 the extension of the third lines between the central station and the pads providing for [the] a decoupling of any one of the pads from the central station and for an elimination

of the indication in the pad of the vehicle addressed by the pad without affecting the provision of the indications from the central station to the other pads of the vehicles addressed by such other ones of the pads and providing for the addressing of the vehicle by any of the other pads.

Claim 78 (amended): In a combination as set forth in claim 76,

the extensions of the third lines between the central station and the pads providing for the extensions of additional third lines between additional pads and the central station to provide first and second binary indications from each of such additional pads to the central station in response to interrogations by the central station to the individual ones of such additional pads without affecting the provision of the first and second binary indications from the pads in the plurality to the central station and without affecting the provision of the indications from the central station to the pads in the plurality of the vehicles addressed by such pads in the plurality and to provide such binary indications at the instant that such extensions of the additional third lines are provided between the additional pads and the central station.

Claim 79 (amended): In a combination as set forth in claim 77,

the extensions of the third lines between the central station and the pads providing for the extensions of additional third lines between additional pads and the central station to provide first and second binary indications from each of such additional pads to the central

5 station in response to interrogations by the central station to the individual ones of such additional pads without affecting the provision of the first and second binary indications from the pads in the plurality to the central station and without affecting the provision of the indications from the central station to the pads in the plurality of the vehicles addressed by such pads in the plurality and to provide such binary indications at the instant that such  
10 extensions of the additional third lines are provided between the additional pads and the central station.

Claim 80 (amended): In combination for use in a system including a central station and a plurality of vehicles and a plurality of pads each [manually] operable to provide first binary indications providing an address to any individual one of the vehicles and second binary indications providing commands for operating the individual one of the vehicles and  
5 each operable to provide the first and second binary indications to the central station for the transmission by the central station to the vehicles of signals representing the first and second binary indications from each of the pads,

a first line extending between the central station and the pads in the plurality to provide an interrogation of such pads of the first and second binary indications from such  
10 pads,

a plurality of second lines each extending between the central station and an individual one of the pads for providing clock signals to the individual one of the pads for

controlling the time of the interrogation of such individual one of the pads by the central station, and

15 a plurality of third lines each extending between the central station and an individual one of the pads for providing the first and second binary indications from the individual one of the pads to the central station in response to the interrogation by the central station to the individual one of the pads,

20 the extensions of the third lines between the central station and the pads providing for the extensions of additional third lines between additional pads and the central station to provide first and second binary indications from each of such additional pads to the central station in response to interrogations by the central station to the individual ones of such additional pads without affecting the provision of the first and second binary indications from the pads in the plurality to the central station and without affecting the provision of the  
25 indications from the central station to the pads in the plurality of the vehicles addressed by such pads in the plurality and to provide such binary indications at the instant that such extensions of the additional third lines are provided between the additional pads and the central station.

Claim 82 (amended): In combination for use in a system including a central station and a plurality of vehicles and a pad [manually] operable to provide first binary indications providing an address to any individual one of the vehicles and second binary indications providing commands for operating the individual one of the vehicles and

5 operable to provide the first and second indications to the central station for the transmission by the central station to the vehicles of signals representing the first and second binary indications from the pad,

10 a first line extending between the central station and the pad to provide an interrogation by the central station of such pad [of] with respect to the first and second binary indications in such pad,

a second line extending between the central station and the pad for providing clock signals to the individual one of the pads from the central station for controlling the time of the interrogation of such pad by the central station,

15 a third line extending between the central station and the pad for providing the first and second binary indications from the pad to the central station in response to the interrogation by the central station to the pad,

first means for storing the first and second binary indications in the pad, and

20 second means associated with the second and third lines for providing a transfer of the binary indications in the first means to the third line in synchronism with the clock signals on the second line when an interrogation of such pad is provided on the first line.

Claim 83 (amended): In a combination as set forth in claim [79] 82 wherein the first means stores the first and second binary indications in the pad in a parallel form and

the second means transfers the binary indications in the first means to the third  
5 [means] line in a serial form.

Claim 84 (amended): In a combination as set forth in claim 82 wherein  
the first line provides a first voltage [on the first line] to provide an interrogation  
of the first and second binary indications in such pad in synchronism with the clock signals  
on the second line and wherein

5 the central station provides through the first line to the pad signals identifying the  
vehicle selected by the pad and wherein

the central station provides such identifying signals to the pad in synchronism  
with the clock signals on the second line during the time that a second voltage different from  
the first voltage is produced on the first line.

Claim 86 (amended): In combination for use in a system including a central  
station and a plurality of vehicles and a pad manually operable to provide first binary  
indications providing an address to any individual one of the vehicles and second binary  
indications providing commands for operating the individual one of the vehicles and  
5 operable to provide the first and second binary indications to the central station for the  
transmission by the central station to the vehicles of the first and second binary indications  
from the pad,

10 a first line extending between the central station and the pad and having a first voltage at first particular times and having a second voltage at second particular times different from the first particular times,

a second line extending between the central station and the pad to provide a transfer of information between the central station and the pad,

15 first means for interrogating the pad to determine the pattern of the first and second binary indications in the pad when the first line has the first voltage,

20 second means operative during the production of the first voltage on the first line for passing the first and second binary indications in the pad to the central station for the transmission to the vehicles by the central station of signals representing [of] such first and second binary indications [by the central station to the pad], and

third means operative during the production of the second voltage on the first line for transmitting to the pad through the second line from the central station signals identifying an individual one of the vehicles addressed by the first binary indications from the pad.

Claim 88 (amended): In combination for use with a plurality of vehicles each having an individual address and each operable when receiving the individual address,

a central station,

5 a plurality of pads each [manually] operable to address any individual one of the vehicles and each providing commands to operate the individual one the vehicles,



each of the pads being connected to the central station for receiving power from the central station to provide first binary indications addressing [the] any individual one of the vehicles and second binary indications providing commands for operating the vehicles,

10 first means in the central station for interrogating each of the pads, separately from the interrogations of the other pads, to determine the first and second binary indications from the pad[s],

second means in the pads for transmitting the first and second binary indications from the pads to the central station upon the interrogation of the pads by the central station,

15 third means in the central station for transmitting to the vehicles the first and second binary indications determined from each of the pads,

the central station and the pads being constructed to provide for a disconnection of any particular one of the pads from the central station and to provide for an addressing by any of the pads other than the disconnected pad of the vehicle previously being addressed by the disconnected pad,

20 the first means being operative to interrogate the other pads, without any interrogation of the particular one of the pads, instantaneously after [upon] the disconnection of the particular one of the pads from the central station,

25 the second means in the pads being operative to transmit the first and second binary indications from the other pads to the central station, without any transmission of any indications from the particular one of the pads to the central station, instantaneously after [upon] the disconnection of the particular one of the pads from the central station,

the third means in the central station being operative to transmit the first and second binary indications from the other pads to the vehicles, without any transmission by the third means of binary indications from the particular one of the pads to the vehicles,  
30 instantaneously after [upon] the disconnection of the particular one of the pads from the central station, and

fourth means responsive in the central station instantaneously to the disconnection of the particular one of the pads from the central station for freeing the vehicle addressed by the particular one of the pads to receive from the central station first binary indications  
35 provided by any [particular] one of the [other] pads other than the disconnected pad and representing the address of such vehicle and second binary indications provided by such [particular] one of the [other] pads and representing commands to such vehicle and for freeing the vehicle to be operated in accordance with such second binary indications.

Claim 89 (amended): In a combination as set forth in claim 88,

the first means being operative to interrogate the pads in the plurality on a cyclic basis before the disconnection of the particular one of the pads from the central station and to interrogate the pads in the plurality, other than the particular one of the pads, on the cyclic  
5 basis instantaneously after the disconnection of the particular one of the pads from the central station.

Claim 90 (amended): In a combination as set forth in claim 88,

the first means being operative to interrogate the pads in the plurality simultaneously before the disconnection of the particular one of the pads from the central station and to interrogate the pads in the plurality, other than the particular one of the pads, simultaneously and instantaneously after the disconnection of the particular one of the pads from the central station.

Claim 91 (amended): In a combination as set forth in claim 88,

fifth means in each of the pads for providing for an illuminated indication in such pad of the individual one of the vehicles addressed by such pad, and

sixth means in each of the [pads] vehicles for providing in such [pad] vehicle an illumination indicating the addressing of such vehicle [individual one of the vehicles addressed by such pad], [and]

seventh means in the central station for discontinuing the illumination of [the individual one of the] vehicle[s] addressed by the particular one of the pads when the particular one of the pads is disconnected from the central station[.], and

eighth means in the central station for discontinuing the illuminated indication in the particular one of the pads of the vehicle addressed by the particular one of the pads when the particular one of the pads is disconnected from the central station.

Claim 92 (amended): In combination for use with a plurality of vehicles each having an individual address and each operable when receiving the individual address,

a central station,

a plurality of pads each [manually] operable to address any individual one of the vehicles and each providing commands to operate the individual one of the vehicles,

each of the pads being connected to the central station for receiving power from the central station to provide first binary indications addressing [the] any individual one of the vehicles and second binary indications providing commands for operating the individual one of the vehicles,

first means in the central station for interrogating each of the pads, separately from the interrogations of the other pads, to determine the first and second binary indications from such pad,

second means in the pads for transmitting the first and second binary indications from the pads to the central station upon the interrogation of the pads by the central station,

third means in the central station for transmitting to the vehicles signals representing the first and second binary indications determined from each of the pads,

the central station and the pads being constructed to provide for the connection of an additional pad to the central station,

the first means in the central station being operative to interrogate the pads in the plurality and the additional pad [upon] instantaneously after the connection of the additional pad to the central station,

the second means in the pads being operative to transmit the first and second binary indications from the pads in the plurality and the additional pad to the central station instantaneously after [upon] the connection of the additional pad to the central station, and

25 the third means in the central station being operative to transmit signals representing the first and second binary indications from the pads in the plurality and the additional pad to the vehicles in the plurality instantaneously after [upon] the connection of the additional pad to the central station.

Claim 93 (amended): In a combination as set forth in claim 92,

the first means being operative to interrogate the pads in the plurality on a cyclic basis before the connection of the additional pad to the central station and to interrogate the pads in the plurality and the additional pad on the cyclic basis instantaneously after the  
5 connection of the additional pad to the central station.

Claim 94 (amended) In a combination as set forth in claim 92,

the first means being operative to interrogate the pads in the plurality simultaneously before the connection of the additional pad to the central station and to interrogate simultaneously the pads in the plurality and the additional pad [simultaneously]  
5 instantaneously after the connection of the additional pad to the central station.

Claim 95 (amended): In a combination as set forth in claim 92,

fourth means in each of the pads for providing for an illuminated indication in such pad of [the] any individual one of the vehicles addressed by such pad,

fifth means in the central station for providing in such pad an illumination  
5 indicating [the] any individual one of the vehicles addressed by such pad,

the fifth means in the central station being operative to continue the illumination of the vehicles addressed by the pads in the plurality and to provide an illumination of the vehicle addressed by the additional pad instantaneously after [when] the additional pad is connected to the central station.

Claim 96 (amended): In a combination as set forth in claim 1,

the pads in the plurality being connected to the central station, and

means in the central station for discontinuing the operation of the vehicle by the individual one of the pads instantaneously after the individual [when the additional] one of  
5 the pads is disconnected from the central station and for providing for the addressing of the vehicle by any one of the pads still connected to the central station.

Claim 97 (amended): In a combination as set forth in claim 5,

the pads in the plurality being connected to the central station, and

means in the central station for providing for the operation of the individual one of the vehicles by any [the individual] one of the pads still connected to the central station

5 instantaneously after the individual [when the second] one of the pads is disconnected from the central station.

Claim 98 (amended): In a combination as set forth in claim 66,  
the central station providing indications, through the third line for each of the pads, to such pad of the individual one of the vehicles [selected] addressed by such pad, and means in each of the pads for indicating the individual one of the vehicles  
5 addressed [selected] by such pad in accordance with the indications provided by the central station to such pad through the third line for such pad.

Claim 99 (amended): In a combination as set forth in claim 75,  
a plurality of lights in each of the pads, each of such lights providing an indication, when illuminated, of an individual one of the vehicles addressed by the pad, and means for illuminating an individual one of the lights in each of the pads in  
5 accordance with the indication from the central station to such pad of the vehicle addressed by such pad.

Claim 100 (amended): In combination for use with a plurality of vehicles,  
a plurality of pads each operative to provide a first plurality of binary indications  
| addressing any individual one of the vehicles and to provide a second plurality of binary

indications providing commands to such individual one of the vehicles for operating such  
5 vehicle,

a central station,

the pads in the plurality being connected to the central station.

first means in the central station for interrogating the pads to determine the first  
and second binary indications from such pads,

10 second means in the pads for transmitting the first and second binary indications  
from the pads to the central station, and

third means responsive in the central station to the identities of the first binary  
indications in successive transmissions of the first and second binary indications from each  
individual one of the pads to the central station for transmitting to the vehicles signals  
15 representing the first and second binary indications for such pad [to the vehicles in the  
plurality],

fourth means in the central station for providing a transmittal by the second means  
at each instant only of the second binary indications from the pads which are providing  
changes in address or commands at that instant.

Claim 101 (amended): *(Write claim 100 in independent form and then add)*  
(In a combination as set forth in claim 100,)

[means in the central station for transmitting at each instant only the second  
binary indications from the pads which are providing changes in commands at that instant.]

an additional pad being connected to the central station, and



fifth means in the central station for providing for an addressing by the additional pad of any of the vehicles not being addressed by the pads in the plurality and for providing for a transmission by the third means of the signals representing the first and second binary indications for the additional pad to the vehicles in the plurality instantaneously after the additional pad is connected to the central station.

Write claim 100 in independent form and then  
Claim 102 (amended): (In a combination as set forth in claim 100, <sup>add</sup>

the first means in the central station being operative to interrogate the pads on a cyclic basis to obtain the binary indications from each of the pads, on the cyclic basis with the other pads, of the individual one of the vehicles addressed by such pad and the binary indications for providing commands for operating the individual one of the vehicles.

Claim 103 (amended): In a combination as set forth in claim 100,

the first means in the central station being operative to simultaneously interrogate the pads to obtain simultaneously from the pads the first binary indications providing the addresses for the individual ones of the vehicles and the second binary indications providing the commands for operating the individual ones of the vehicles.

Claim 104 (amended): In combination for operating a vehicle in accordance with addresses and commands provided by a [pair] plurality of [handheld] pads and transmitted by a central station to the vehicle,

first means in the vehicle for receiving the addresses and commands provided by  
the pads and transmitted by the central station,

second means in the vehicle for identifying the received addresses as those of the  
vehicle,

third means responsive in the central station to the identification of the addresses  
received from the pads as those of the vehicle for providing for an execution of the received  
commands by the vehicle in accordance with such commands when the identified commands  
are complementary, and

fourth means responsive in the central station to the identification of the addresses  
received from the pads as those of the vehicle for providing for an execution by the vehicle  
of commands different from the commands provided by the pads when the commands are  
contradictory.

Claim 105 (amended): In a combination as set forth in claim 104,

fifth means responsive in the vehicle to the discontinuance of one of the pads in  
the plurality in addressing the vehicle for continuing the response of the vehicle to the  
addresses and commands from the [other one of the] pads [in the pair] still addressing the  
vehicle.

Claim 106 (amended): In a combination as set forth in claim 23,

the first means being operative to interrogate the pads in the plurality and [an] the additional pad on a cyclic basis,

the second means being responsive on the cyclic basis to the interrogation

provided by the first means of the pads in the plurality and the additional pad for sending the addresses and commands to the addressed vehicles to obtain an operation of such vehicles in accordance with such commands.

Claim 107 (amended): In a combination as provided in claim 2[6]3,

the first means being operative to interrogate the pads [on a cyclic basis] in the plurality and the additional pad simultaneously,

the second means being responsive to the simultaneous interrogation provided by

the first means of the pads in the plurality and the additional pad for sending the addresses and commands to the addressed vehicles to obtain an operation of such vehicles in accordance with such commands.

Claim 108 (amended): In combination for use in a system including a plurality of vehicles each responsive to an individual address and to a plurality of commands for providing individual operations of vehicles in accordance with such commands,

a plurality of pads each operative to provide an address for selecting any individual one of the vehicles and to provide commands to such individual one of the

vehicles for operating such individual one of the vehicles in accordance with such commands,

a central station) [connected to the pads] the pads being connected to the central station,

10 first means in the central station for interrogating the pads [on a cyclic basis] to determine the address and the commands provided by such pads,

second means responsive in the central station to the interrogation provided by the first means in the central station concerning the address and the commands from [such] each pad for receiving the address and the commands from such pad and for transmitting to the  
15 vehicles signals representing the address and the commands from such pad [to the vehicles in the plurality], and

third means responsive in the central station to any change in the address or commands from an individual one of the pads for transmitting the address and the commands from such pad to the vehicles in the plurality on a priority basis relative to the  
20 address and commands from the other pads in the plurality.

Claim 109 (amended): In a combination as set forth in claim 108 wherein the central station discontinues [the] an interrogation of any pad which is disconnected from the central station instantaneously after the pad is disconnected from the central station and wherein

5           the central station provides for the addressing by any of the pads still connected to  
the central station of the vehicle previously addressed by the disconnected pad.

Claim 111 (amended): In combination for use in a system including a plurality of  
vehicles each responsive to an individual address and to a plurality of commands for  
providing individual operations of vehicles in accordance with such commands,

5           a plurality of pads each operative to provide an address for selecting any  
individual one of the vehicles and to provide commands to such individual one of the  
vehicles for operating such individual one of the vehicles in accordance with such  
commands,

          a central station [connected to the pads,] the pads being connected to the central  
station.

10           first means in the central station for interrogating the pads [on a cyclic basis] to  
determine the address and the commands provided by such pads,

          second means responsive in the central station to the interrogation provided by the  
first means in the central station concerning the address and the commands from such pads  
for receiving the address and the commands from such pads and for transmitting the address  
15           and the commands from such pads to the vehicles in the plurality, and

          third means responsive in the central station to the [coupling] connection of an  
<sup>additional</sup> (individual) one of the pads <sup>other than the pads in the plurality,</sup> to the central station and to the reception by the [such] central  
station of the [an] address and commands from such <sup>additional</sup> (individual) one of the pads for

20 <sup>initially</sup> transmitting such address and commands from such <sup>additional</sup> individual one of the pads on a priority basis relative to the transmission of the address and commands from the other ones of the pads. <sup>with the plurality</sup>

Claim 112 (amended): In a combination as set forth in claim 111 wherein the central station is operative to transmit [for transmitting] to the vehicles at each instant only the addresses and commands from the pads which are providing changes in addresses or commands at that instant.

*Note change in 113*

5 Claim 122 (amended): In combination for use in a system including a plurality of vehicles each responsive to an individual address and to a plurality of commands for providing individual operations of the vehicles in accordance with such commands, a plurality of pads each operative to provide an address for selecting any individual one of the vehicles and to provide commands to such individual one of the vehicles for operating such individual one of the vehicles in accordance with such commands,

a central station [connected to the pads], the pads being connected to the central station,

10 first means in the central station for interrogating the pads to determine the address and the commands provided by such pads,

second means responsive in the pads to the interrogation by the central station for transmitting the address and the commands from the pads to the central station,

third means in the central station for receiving the addresses and the commands transmitted by the pads to the central station, and

fourth means in the central station for transmitting to the vehicles in the plurality only the address and commands transmitted from each pad to the central station that are different from the immediately preceding address or commands transmitted from such pad to the central station.

Claim 123 (amended): In a combination as set forth in the claim 122,

the first means in the central station being operative to interrogate the pads simultaneously [on a cyclic basis] and the pads being operative to transmit the addresses and the commands from such pads to the central station when interrogated.

Claim 124 (amended): In combination for use in a system including a plurality of vehicles each responsive to an individual address and to a plurality of commands for providing individual operations of the vehicles in accordance with such commands,

a plurality of pads each operative to provide an address for selecting any individual one of the vehicles and to provide commands to such individual one of the vehicles for operating such individual one of the vehicles in accordance with such commands,

a central station [connected to the pads], the pads being connected to the central station,

10 a plurality of first switches each included in an individual one of the pads and having first and second [modes] states[,] of operation and operative in the first [mode] state a successive number of times to address any individual one of the vehicles,

each of the pads including a plurality of lights each indicating an individual one of the vehicles when illuminated,

15 first means in the central station for remembering at each instant the individual ones of the vehicles being addressed by the pads at that instant,

a plurality of second switches each having first and second operative relationships and each disposed in an individual one of the pads and each operative in the first relationship to provide for the [selection] addressing of only one of the vehicles by such individual one  
20 of the pads and operative in the second relationship to provide for the addressing by any other one of the pads of the [same] vehicle simultaneously being addressed by such individual one of the pads,

second means responsive in each of the pads to the operation of the first means in  
the central station and to the operation of the second switch in each [such] pad in the first  
25 relationship for skipping over the lights representing in such pad the vehicles being addressed by the other pads when the first switch in such pad receives successive actuations to the first [mode] state of operation, and



30 third means responsive[,] in the other one of the pads to the operation of the first means in the central station and to the operation of the second switch in the individual one of the pads in the second relationship[,] for including, in the sequence of lights in such other one of the pads, the light in the vehicle addressed by such individual one of the pads in the second [mode] state of operation of the second switch in such individual one of the pads even when such vehicle is simultaneously being addressed by another one of the pads.

5 Claim 125 (amended): In a combination as set forth in claim 124, means in the central station for transmitting the address and commands from the individual one of the pads and the [such] other one of the pads to the vehicle addressed by such individual one of the pads when the second switch in [such] the individual one of the pads is in the second [mode] state of operation.

5 Claim 126 (amended): In combination, a plurality of vehicles each having an individual address, a plurality of pads each operative to provide an address for selecting any individual one of the vehicles and to provide commands to such individual one of the vehicles for operating such individual one of the vehicles in accordance with such commands, a central station [connected to the pads], the pads being connected to the central station.

each of the pads being operative to transmit the address and the commands from  
10 such pad to the central station for transmission by the central station to the vehicles,

each individual one of the vehicles having a light for illumination when such  
vehicle is addressed and commanded by the central station as a result of the address and  
commands from an individual one of the pads,

15 first means in the central station for storing the addressing by each individual one  
of the pads of the individual one of the vehicles,

second means in the central station for communicating a command to the  
individual one of the vehicles to extinguish the light in such vehicle instantaneously after  
[when] the individual one of the pads providing the address and the commands to such  
individual one of the vehicles becomes disconnected from the central station, and

20 third means in each individual one of the vehicles for extinguishing the light in  
such individual one of the vehicles in accordance with the communication from the central  
station.

Claim 127 (amended): In a combination as set forth in claim 126,

fourth means in the central station for eliminating the storage of the addressing by  
each individual one of the pads of the individual one of the vehicles instantaneously after  
[when] such individual one of the pads becomes disconnected from the central station.

Claim 128 (amended): *write claim 126 and then add claim 127 and then add*  
(In a combination as set forth in claim 127,)

fifth means in the central station for interrogating [on a cyclic basis] the pads connected to the central station to determine the address and the commands from such pad to the vehicles,

5 sixth means for receiving in the vehicles from the central station the address and the commands [from] provided by each of the pads upon the interrogation of such pad by the central station, and

seventh means in the central station for eliminating one of the pads from the [cyclic] interrogation by the central station, [when] instantaneously after such pad becomes  
10 disconnected from the central station, without affecting the interrogation of the other pads by the central station and for providing for the addressing by any of the other pads of the vehicle previously addressed by the disconnected pad.

Claim 146 (amended): In combination for use with a plurality of pads each operative to provide an address and commands and a central station for transmitting at a particular frequency a carrier signal modulated with the addresses and commands from the pads,

5 a vehicle,  
means in the vehicle for receiving from the central station the carrier signals modulated with the address individual to such vehicle,

means for powering the vehicle in accordance with the reception by such vehicle of the modulated carrier signals individual to such vehicle,

10 means in the vehicle for demodulating the modulat[ing]ed carrier signals to recover the commands individual to such vehicle,

the vehicle including wheels for moving the vehicle and including motors for rotating the wheels,

15 means in the receiv[er]ing means for providing pulse width modulations for energizing the motors in the vehicle to move the vehicle, the pulse width modulations providing progressive increments of time for energizing the motors to accelerate the vehicle, and

*successive ones of the*  
*in the pulse width*

means in the receiv[er]ing means for progressively energizing the motors with the pulse with modulations for the progressive increments of time to accelerate the motors.

*successive ones of the*  
*in the pulse width*

*Note change in claim 147*

Claim 148 (amended): In combination,

a plurality of vehicles each responsive to an individual address provided to such vehicle and each operative in accordance with commands provided to such vehicle after the reception by such vehicle of such individual address,

5 a plurality of pads each operative to provide [the] addresses individual to any one of such vehicles and to provide [the] commands for operating such vehicle[s],

a central station operatively coupled to the pads for receiving the addresses and the commands from the pads and for transmitting [such addresses and commands] to the

vehicles addresses and commands in packets each composed of a plurality of binary  
indications representing the address and the commands for any individual one of the vehicles  
and each having start bits at the beginning of the packet and having the address and  
commands following the start bits [and having the commands following the address, the  
packets from the different pads in the plurality following one another] with no time  
separation between successive ones of the packets,

means in the central station for transmitting the packets of the binary indications  
to the vehicles,

means in the vehicles for receiving the packets of the binary indications  
transmitted by the central station, [and]

means responsive in each of the vehicles to the address individual to such vehicle  
for operating the vehicle in accordance with the commands following such address[.], and

means in the central station for regulating the rate of transmitting the bits in the  
packets to the vehicles in accordance with the time between the start bits in the successive  
packets of the binary information.

Claim 149 (amended): In a combination as set forth in claim 148,  
each of the vehicles having wheels,  
each of the vehicles having an operating member different from the wheels, and  
each of the packets including first commands for providing for a [rotating]  
rotation of the wheels in an individual one of the vehicles in accordance with the binary

indications representing in such packet such individual one of the vehicles and including second commands [for rotating the wheels in such individual one of the packets and including third commands] for providing an [operating] operation of the member in such individual one of the packets,

10                    means in each of the vehicles for rotating the wheels in such vehicle in accordance with the first commands in the packets addressed to such vehicle, and

                    means in each of the vehicles for operating the operating member in such vehicle in accordance with the second commands in the packets addressed to such vehicle.

**PLEASE ADD THE FOLLOWING NEW CLAIMS:**

152. In a combination as set forth in claim 66,  
the third lines providing the first and second binary indications when the clock signals on the third lines have the other one of the first and second polarities

153. In a combination as set forth in claim 104,  
a memory in the vehicle for storing the contradictory commands and for storing a special command to be executed by the vehicle when the commands provided by the pads are contradictory, and

5                    means responsive in the vehicle to the special command in the memory for providing an execution by the vehicle of the special command when the commands in the vehicle are contradictory.

154. In a combination as set forth in claim 108 wherein

10 the central station initiates an interrogation of any pad which is connected to the central station, instantaneously after the pad is connected to the central station, to determine if the pad has addressed any one of the vehicles not then being addressed by any of the other pads.

155. In combination for use with a plurality of vehicles each having an individual address and having members for moving the vehicles,

a central station,

5 a plurality of pads each operatively connected to the central station and each operative to provide addresses individual to any one of such vehicles and to provide commands for operating such vehicle,

10 the central station being operative to receive the addresses and commands from the pads and to transmit to the vehicles addresses and commands in packets each composed of a plurality of binary indications representing the address and the commands for an individual one of the vehicles,

means in the central station for transmitting the packets of the binary indications to the vehicles,

15 each of the pads including a switch actuatable a number of times to select any one of the vehicles, the particular number of times being dependent upon the particular one of the vehicles to be addressed by the pad,

memory means in the central station for remembering each of the vehicles addressed at any instant and the pad addressing the vehicle, and

means in the central station for preventing each of the pads from addressing one of the vehicles already being addressed by another one of the pads.

156. *(Write claim 155 and add)*  
(In a combination as set forth in claim 155,)

there being a plurality of light illuminable members in each pad, each of the light illuminable members being operable, when illuminated, to indicate an individual one of the vehicles,

5 the preventing means in the central station being operable to prevent each pad from illuminating light illuminable members individual to vehicles being addressed by the other pads.

*Note additional changes in claim 156: see following amendment*

157. In combination for use with a plurality of vehicles each having an individual address and having members for moving the vehicles,

a central station,

5 a plurality of pads coupled to the central station, each of the pads having a first member actuatable a sequential number of times to address any one of the vehicles dependent upon the number of actuations and having second members actuatable to provide for a movement of the addressed vehicle,



means in the central station for interrogating the pads to determine the number of actuations of the first member in each of the pads and to determine the actuations of the second members in each of the pads,

means in the central station for providing for each of the pads first binary indications addressing the vehicle being selected by the pad and second binary indications relating to the movements to be provided in the vehicle,

means in the central station for remembering each pad and the vehicle selected by the pad and for providing for the transmittal of such information to the pads, and

means responsive in the pads to the remembered information transmitted to the pads from the central station for skipping in each pad the binary indications of vehicles already being addressed by others of the pads when the first member in the pad is actuated the sequential number of times.

158. In a combination as set forth in claim 157,

there being in each pad a plurality of light illuminating members each one for a different one of the vehicles and each being illuminable to identify the vehicle selected by the pad, and

means responsive in each pad to the remembered information transmitted to the pad from the central station for skipping the light illuminating members indicating the vehicles already being addressed by others of the pads when the first member in the pad is actuated the sequential number of times to address one of the vehicles.

159. In combination for use in a system including a plurality of vehicles each  
10 responsive to an individual address and to a plurality of commands for providing individual  
operations of such vehicles in accordance with such commands,

a plurality of pads, each individual one of the pads including a plurality of  
switches having first and second states of operation for providing an address to select any  
individual one of the vehicles and for providing commands to such individual one of the  
15 vehicles for operating such individual one of the vehicles in accordance with such  
commands,

^ a central station, the pads being connected to the central station for interrogation  
simultaneously by the central station concerning the states of operation of the switches in the  
pads,

20 first means responsive in the pads to the simultaneous interrogation by the central  
station of the states of operation of the switches in the pads for transmitting to the central  
station binary indications of such states of operation, and

second means responsive in the central station to the binary indications of the  
states of operation of the switches in the pads for transmitting to the vehicles signals  
25 representing such binary indications.

160. In a combination as set forth in claim 159,

the first means being responsive in the pads to the simultaneous interrogations by  
the central station of the states of operation of the switches in the pads for simultaneously

transmitting to the central station the binary indications of the states of operation of the  
5 switches in the pads in the plurality.

161. In a combination as set forth in claim 159,

the second means being responsive in the central station to the simultaneous  
transmission to the central station of the binary indications of the states of operation of the  
switches in the pads in the plurality for transmitting to the vehicles in sequence the signals  
5 representing such binary indications for the different pads in the plurality.

162. In combination at a central station for controlling the operation of a  
plurality of vehicles in accordance with the addressing of the vehicles by pads in a plurality  
and in accordance with the operation in the pads of controls to obtain the performance of  
functions in the vehicles,

5 first means for simultaneously interrogating the pads in the plurality to determine  
from the pads the addressing of the vehicles and the functions to be performed in the  
addressed vehicles,

second means for receiving from the pads binary indications of the vehicles  
addressed by the pads and the functions to be performed in the addressed vehicles,

10 third means responsive to the binary indications from the pads for providing  
signals representing the binary indications, and

fourth means for transmitting to the vehicles the signals representing the binary indications from the pads.

163. In a combination as set forth in claim 162,

the third means being simultaneously responsive to the binary indications from the pads in the plurality to simultaneously provide the signals representing the binary indications.

164. In a combination as set forth in claim 163,

the fourth means being operative to transmit in sequence to the vehicles in the plurality the signals representing the binary indications from each individual one of the pads.

**REMARKS**

Claims 14-15, 31, 114-115, 116-118, 119-121, 129-131 and 132-135 have been previously canceled by a preliminary amendment dated April 20, 1998. Claims 16-17, 81, 136-145 and 150-151 have been canceled by this amendment. Claims 152-164 have been added by this amendment. As a result, claims 1-13, 18-30, 32-80, 82-113, 122-128, 146-149 and 152-164 are in the application.

1. The claims in the application have been provisionally rejected under the judicially created doctrine of double patenting over claims 1-97 of co-pending application 08/578,210. Actually, as will be seen from the subsequent discussion with respect to the prior art patents cited by the Examiner, a significant number of the features recited in the claims in this application are not disclosed in application 08/578,210 for the same reasons that they are not disclosed in the prior art references. Actually, each of the claims in this application recites features which are not disclosed in co-pending application 08/578,210. This would prevent applicant from presenting in application 08/578,210 claims corresponding to the claims in this application.

The Examiner has indicated that applicant can file a terminal disclaimer to overcome the rejection on the basis of application 08/578,210. Applicant is accordingly filing such a terminal disclaimer with this amendment. Applicant respectfully submits that

this terminal disclaimer should eliminate co-pending application 08/578,210 as a prior art reference.

2. The claims in the application have been provisionally rejected under the judicially created doctrine of double patenting over claims 1-75 of co-pending application 08/696,263. Actually, as will be seen from the subsequent discussion with respect to the prior art patents cited by the Examiner, a significant number of the features recited in the claims in this application are not disclosed in application 08/696,263 for the same reasons that they are not disclosed in the prior art patents. Actually, each of the claims in this application recites features which are not disclosed in co-pending application 08/696,263. This would prevent applicant from presenting in application 08/696,263 claims corresponding to the claims in this application.

The Examiner has indicated that applicant can file a terminal disclaimer to overcome the rejection on the basis of application 08/696,263. Applicant is accordingly filing such a terminal disclaimer with this amendment. Applicant respectfully submits that this terminal disclaimer should eliminate co-pending application 08/696,263 as a prior art reference.

3. The Examiner has objected to the drawings on the ground that they are informal. Applicant will submit formal drawings to the Examiner after the application has been allowed.

4. The Examiner has objected on page 4 of the Office Action dated July 8, 1998, to claims 89, 90, 93, 94, 102 and 103 under 35 U.S.C. § 112 as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. According to the Examiner:

“These claims state cyclic or simultaneous inquiry of the pads. By such claiming, Applicant asserts that either or both of the cyclic or simultaneous inquiry is not critical. By Applicant’s admission these concepts are held to not be critical and are considered as such.”

Applicant does not know of any law or court decision which holds a recitation of an element in a claim to be indefinite merely because there are two (2) different ways of providing the element. Actually, the law is quite clear that such a recitation is definite. For example, claims are constantly being allowed which recite that an element is selected from a group consisting of elements A, B and C.

Applicant is not certain what the Examiner means by the word "critical" in the above quotation. Regardless, applicant does not know of any law which indicates that an element in a claim becomes "non-critical" because there are two (2) different ways of providing the element. This is particularly true when applicant recites the element on a generic basis in a first claim and then recites two (2) different ways of providing the element in successive dependent claims.

5. Claims 6-8, 20-22, 61 and 62 have been rejected under 35 U.S.C. 102(b) as being clearly anticipated by Yavetz. As now written, claim 6 is allowable over Yavetz because Yavetz does not disclose a plurality of pads each operative to select any of the vehicles in a plurality. As now written, claim 6 is also allowable over Yavetz because Yavetz does not disclose, in the combination recited in claim 6, that a first pad includes an additional switch having first and second states of operation and operative in the first state to provide for an operation of the vehicle only by an individual one of the pads and operative in the second state to provide for an operation of the vehicle by other pads in the plurality in addition to the pad. There is no disclosure in Yavetz of means in the pad for providing a plurality of light indications each for a particular one of the vehicles in the plurality and means in the first pad for providing first light indications for the vehicles in the plurality when such first pad has not provided an address for any of the vehicles in the plurality. No disclosure is further provided in Yavetz of means in the first pad for providing a second



illumination for the individual one of the vehicles when the first pad provides the address for such individual one of the vehicles.

Claim 7 is dependent from claim 6 and is accordingly allowable over Yavetz for the same reasons as claim 6. Claim 7 is additionally allowable over Yavetz because Yavetz does not disclose means responsive in each of the pads to the sequential operations of a switch in the pad for skipping the addressing by the pad of a vehicle in the plurality which has already been addressed by another of the pads in the plurality.

Since claim 8 is dependent from claim 6, it is allowable over Yavetz for the same reasons as claim 6. Claim 8 is further allowable over Yavetz because of the recitation that the first light indications constitute a sequential activation of the light indications in the plurality on a cyclic basis. Claim 8 is additionally allowable over Yavetz because it recites means in the pad for discontinuing the sequential activation of the light indication in the pad and for providing a continuous activation of an individual one of the light indications in the pad when the pad is operated to address the vehicle represented by the individual one of the light indications.

Claim 20 is allowable over Yavetz for certain important reasons. Yavetz does not disclose a first switch in the pads, the first switch having first and second states and operable on a repetitive basis to the second state for a particular number of times to select an

individual one of the vehicles to be addressed by the central station. Yavetz also does not disclose a plurality of light indications in a pad, each of the light indications being associated with a different one of the vehicles in a plurality. There is also no disclosure in Yavetz of means for energizing the light indications in sequence on a cyclic basis before any operations of the first switch in the pad to the second state to select the individual one of the vehicles in the plurality and means for continuously energizing the individual one of the light indications associated with the individual one of the vehicles when the first switch in the pad has been operated to the second state on a repetitive basis for the particular number of time to select the individual one of the vehicles to be addressed by the central station. No disclosure is further made in Yavetz of means for skipping the energizing of the light indications associated with the vehicles addressed by the pads in the plurality other than the pad when the first switch in the pad is operated on the repetitive basis to address the individual one of the vehicles.

Because of its dependency from claim 20, claim 21 is allowable over Yavetz for the same reasons as claim 20. Claim 21 is additionally allowable over Yavetz because it recites means in the pad for providing for the addressing of the individual one of the vehicles by another pad in the plurality in addition to the addressing of the individual one of the vehicles by the pad.

Since claim 22 is dependent from claim 20, it is allowable over Yavetz for the same reasons as claim 20. Claim 22 is additionally allowable over Yavetz because it recites means for sending to the central station a first plurality of binary indications representing the repetitive operation of the first switch in the pad to the second state to provide an address by the central station for the individual ones of the vehicles in the plurality and for sending to the central station a second plurality of binary indications representing the pattern of operation of the additional switches in the pad to the second state to provide the commands by the central station for operating the individual one of the vehicles.

Claim 61 recites second means in the vehicle for determining whether at least a particular percentage of the packets addressed to the vehicle during a particular period of time has the second particular number of the second signals in such packets. There is also a recitation in claim 61 of third means in the vehicle for operating the vehicle in accordance with the second signals in the packets addressed to the vehicle when the second means in the vehicle determines that at least a particular percentage of the packets addressed to the vehicle during the particular period of time has the second particular number of the second signals in the packets. These features are not disclosed in Yavetz. Claim 62 is allowable over Yavetz for the same reasons as claim 61 because it is dependent from claim 61.

6. Claims 147 and 148 have been rejected under 35 U.S.C. 102(b) as being clearly anticipated by Rosenhagen. Claim 147 is allowable over Rosenhagen because Rosenhagen does not disclose means in a receiver for providing pulse width modulations for energizing the motors in the vehicle to move the vehicle, the pulse width modulations providing progressive increments of time for energizing the motors to accelerate the vehicle. There is also no disclosure in Rosenhagen of means in the receiving means for progressively energizing the motors with the pulse width modulations for the progressive increments of time to accelerate the motors. No disclosure is further provided in Rosenhagen that the vehicles are progressively energized with the pulse width modulations for the progressive increments of time from a zero time in the pulse width modulations to accelerate the motors in the vehicle.

Claim 148 is also allowable over Rosenhagen for certain important reasons. Rosenhagen does not disclose a central station and also does not disclose that the central station is operatively coupled to pads for receiving the addresses and the commands from the pads and for transmitting such addresses and commands to the vehicles in packets each composed of a plurality of binary indications representing the address and the commands for an individual one of the vehicles and each having start bits at the beginning of the packet and having the address and commands following the start bits. There is also no disclosure in Rosenhagen that the packets from the different pads in the plurality follow one another with no time separation between successive ones of the packets. Rosenhagen additionally does

not disclose means in the central station for regulating the rate of transmitting the bits in the packets to the vehicles in accordance with the time between the start bits in the successive packets of the binary information.

7. Claims 1, 2, 4, 5, 9, 10, 18-19, 28, 29, 33-39, 43-60, 86-97, 100-103, 108-110 and 129-131 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Yavetz in view of Stern. In rejecting these claims, the Examiner has stated on page 5 of the Office Action dated July 8, 1998:

“Yavetz discloses a toy set with light indicators on the controllers and transmitters for each controller. He lacks a central station for controller input. This is taught by Stern. It would have been obvious to one of ordinary skill in the art to have provided a Yavetz set with a central station, as taught by Stern, in order to save money by only requiring a single transmitter for the set, instead of the many transmitters, one for each controller.”

As the Examiner has admitted, Yavetz does not provide a central station. It is questionable whether Stern provides a central station. This results from the fact that Stern employs a multi-channel FM telemetry oscillator 38. Stern states in column 3, lines 55-59 as follows:

“It will be understood that the control signals emitted from the telemetry network 38 are of selective frequencies tuned to the respective vehicles on the track as will be more fully understood hereafter.”

Since Stern provides a signal with a different frequency for each track, each track may be considered to provide a different transmitter. Each transmitter may be considered to provide a central station. Stern may accordingly be considered to provide a plurality of stations rather than a central station.

However, it is moot whether Stern provides a central station for the different tracks or a plurality of central stations each provided for a different track. The reason is that claims 1, 2, 4, 5, 9, 10, 18-19, 28, 29, 33-39, 43-60, 86-97, 100-103, 108-110 and 129-131 are distinguished over Stern in a number of important respects other than the issue of a central station. Furthermore, these claims are distinguished over Yavetz in the same respects as they are distinguished over Stern. This prevents Yavetz and Stern from being combined to reject the claims.

One significant difference is that, in applicant's system, each pad is capable of addressing any of a plurality of vehicles and of controlling the operation of the addressed vehicle. This is not true in either Yavetz or Stern. In each of Yavetz and Stern, each pad is

able to address and control the operation of only a single vehicle. In order for Yavetz to address an individual one of the vehicles, he has to manually change the address of the vehicle in the pad so that the address of the pad corresponds to the address of the individual one of the vehicles. This involves a manual change in the setting of a number of switches in Yavetz. Stern cannot even make such a change since each control unit 26 is connected by wires to the telemetry network 38 and the telemetry network is connected by wires to each of the vehicles 20. As a result, the telemetry network 38 for each of the control units 26 in Stern is coupled only to the associated one of the control units 26 and only to the associated one of the vehicles 20.

There are other significant differences between applicant's system and each of Yavetz and Stern and these differences appear in applicant's claims. These differences include:

- (a) The telemetry network 38 in Stern does not transmit signals sequentially from the different control units 26 to the vehicles 20. Yavetz also does not provide such a signal transmission;
- (b) The telemetry network 38 in Stern does not interrogate the different control units 26 to determine the operating characteristics of the different control units. Yavetz has a similar deficiency;
- (c) The telemetry network 38 in Stern does not interrogate the different pads (or control units) in a time pattern with the interrogation of other control units to

determine the operating characteristics of the control unit. This is true whether the interrogation of the different pads (or control units) is cyclic or simultaneous. Yavetz is also lacking the same feature;

(d) Stern does not provide for an addressing of each of the vehicles 20 by successive operations of a first control in any one of the control units 26 when the vehicle is released by a control unit previously addressing the vehicle. Actually, Stern does not release any of the vehicles 20 from control at any time by an associated one of the control units 26 since the vehicle 20 and the control unit 26 appear to be permanently coupled. Yavetz is also lacking in such a disclosure;

(e) Stern does not receive from each of the control units 26, on a periodic basis with others of the control units, indications providing for the addressing of any one of the vehicles 20 by such control unit. Yavetz is also deficient in this regard;

(f) Stern does not provide for the addressing of each of the vehicles 20 by any of the control units 26 when the control unit previously addressing the vehicle addresses another one of the vehicles. Yavetz is also lacking in this regard;

(g) Stern does not provide a pairing of each of the control units 26 and the vehicle 20 addressed by the control unit and does not store the pairing of the control unit and the vehicle addressed by the control unit during the time that the vehicle is addressed by the control unit. Yavetz also does not provide such a pairing;

(h) Stern does not eliminate the storage of the pairing of each of the control units 26 and the vehicle 20 addressed by the control unit when the control unit addresses



another one of the vehicles or when the control unit fails to address the vehicle for a particular period of time. This is also true of Yavetz;

(i) Stern does not provide a memory pairing each control unit 26 and an individual one of the vehicles addressed by the control unit. Stern also does not eliminate the pairing when the control unit addresses another one of the vehicles or fails to address the individual one of the vehicles for a particular period of time. This is also true of Yavetz;

(j) Stern does not provide in the telemetry network 38 a memory for storing the addressing of each of the vehicles 20 by one of the control units 26. Yavetz also does not provide such a memory. Yavetz is also lacking in this regard;

(k) Stern does not provide an operable member which performs functions in each of the vehicles other than providing a movement of the vehicle;

(l) Stern does not receive from each of the control units 30, on a periodic basis with the others of the control units, indications providing for the operation of an operable member in any of the vehicles addressed;

(m) Stern does not provide a single switch in each pad for addressing any one of the vehicles, the vehicle addressed by the pad being dependent upon the number of actuations of the switch. Neither does Yavetz;

(n) Since Stern does not have a single switch in each control unit as set forth in the previous paragraph, Stern does not skip, in the operation of a single switch controlling the addressing any individual one of the vehicles, the vehicles already being addressed by

other control units. Yavetz also does not have a single switch which performs such functions;

(o) Stern does not provide in each control unit 30 an illumination identifying the vehicle being addressed by the control unit. Neither does Yavetz. Although Yavetz provides an illumination in a vehicle, Yavetz provides this illumination in the addressed vehicle every time that the LED 112 is activated to indicate a fire command signal from the controller 12. However, this illumination in Yavetz does not identify the vehicle. Furthermore, the illumination occurs only at isolated instants. It would have been desirable in Yavetz to provide a visual illumination identifying the vehicle being addressed at each instant. Since Yavetz failed to do so even though Yavetz provided a light indication, this indicates that it was not obvious to a person of ordinary skill in the art to provide such a visual indication. This is particularly true since Yavetz may be considered to constitute a person skilled in the art;

(p) Stern does not provide in each vehicle an illumination identifying the vehicle during the time that the vehicle is being addressed by one of the control units. This is also true of Yavetz;

(q) Stern does not provide in each pad a visual indication of the vehicle being addressed by the pad. Yavetz is also lacking in this regard;

(r) Stern does not provide for the addressing of one of the vehicles 20 by more than one of the control units 26. This is also true of Yavetz;

(s) Stern does not provide for the production of special commands in a vehicle when the vehicle is addressed by contradictory commands from more than one of the pads. This is also true in Yavetz;

(t) Stern does not provide for a continuance in the addressing of a vehicle by one pad when another pad simultaneously addressing the vehicle stops addressing the vehicle. Yavetz also does not provide this;

(u) Stern does not disclose a system in which a user can have a pad instantaneously address a particular vehicle by the actuation of a particular switch after the user has had the pad address another vehicle and now wishes to address again the particular vehicle. Yavetz also does not disclose this;

(v) Stern does not disclose a system in which an additional pad is connected to the central station and in which the central station sends to the vehicles the addresses and commands from the pads previously connected in the plurality to the central station and from the additional pad, instantaneously after the connection of the additional pad to the central station, without affecting the interrogation of the pads in the plurality by the central station and in which the additional pad can address any of the vehicles not being addressed by any of the pads in the plurality. There is also no disclosure of this in Yavetz;

(w) Stern does not disclose a system in which a pad is disconnected from the central station and in which the central station sends to the vehicles the addresses and commands from the pads in the plurality other than the disconnected pad, instantaneously after the disconnection of the pad from the central station, without affecting the interrogation

of the other pads by the central station and in which the other pads are able to address the vehicle previously addressed by the disconnected pad after the disconnection of the pad from the central station. Yavetz also does not provide such a disclosure;

(x) Stern does not disclose a system in which the central station provides for the sending to the vehicles from the pads of only the commands which are providing changes in addresses or commands at that instant;

(y) Stern does not disclose a system in which the central station provides packets of signals representing addresses and commands from the packets in the plurality and in which the packets include start signals and in which the addressed vehicles use the time between the start signals in successive packets to co-ordinate the response of the addressed vehicles with the signals in the packets. No disclosure is also provided of this in Yavetz;

(z) Stern does not disclose a system in which the central station simultaneously interrogates the pads in the plurality to obtain the addresses and commands from the pads. This is also lacking in Yavetz;

(aa) There is no disclosure in Stern of a system in which the pads in the plurality simultaneously transmit their addresses and commands to the central station. Yavetz also does not provide such a disclosure;

(ab) There is no disclosure in Stern of a system which employs pulse width modulations at progressive instants of time to obtain progressive increments in the speed of the vehicle at such progressive instants of time from a zero speed to a desired speed. There is also no disclosure of this in Yavetz;

(ac) Stern does not disclose a system which instantaneously applies signals to the right and left wheels of a vehicle, when the right and left wheels are rotating at different speeds because of a turning of the vehicle and the user wishes the wheels to move forwardly, to have the right and left wheels move instantaneously at the higher of the speeds of the right and left wheels. Yavetz also does not disclose this;

(ad) No disclosure is provided in Stern of a system in which the vehicle has the same operation for a particular period of time as the operation of the vehicle upon the last reception of signals from the central station when the vehicle does not receive signals from the central station for the particular period of time;

(ae) Stern does not disclose a system in which an addressed vehicle responds to commands from a central station only when the vehicle has received the same commands from the central station at least a pair of successive times. Yavetz is also lacking this feature;

(af) There is no disclosure in Stern of a system in which a vehicle responds to commands from a central station when the vehicle determines that at least a particular percentage of the packets addressed to the vehicle during a particular time period has a particular number of address signals. Yavetz is also missing this feature;

(ag) No disclosure is provided in Stern of a system in which a vehicle responds to commands from a central station when the vehicle determines that at least a particular percentage of the packets addressed to the vehicle during a particular time period has a particular number of command signals. Yavetz also does not disclose this;

(ah) Stern does not disclose a system which includes a first line, a second line or plurality of lines and a third line or plurality of lines such as recited in claims 63-85. Yavetz also does not provide such a disclosure.

For the record, neither application 08/578,210 nor application 08/696,263 discloses any of the features specified above in paragraphs (n) through (ah). At least one of these features is recited in every one of the claims in this application. Because of this, none of the claims in application 08/578,210 and in application 08/696,263 can present a problem of double patenting with respect to the claims in this application. However, as previously indicated, applicant is filing a terminal disclaimer with respect to each of applications 08/578,210 and 08/896,263 to expedite the prosecution of this application.

Claim 1 is allowable over the combination of Yavetz and Stern for certain important reasons. Neither reference discloses a plurality of pads each including a plurality of switches having first and second states of operation for providing an address to select any individual one of a plurality of vehicles. Neither reference further discloses a central station responsive to the operation of the switches in each individual one of the pads in the first and second states for sending the address and commands from the individual one of the pads to the individual one of the vehicles. There is also no disclosure in either reference of an additional switch on each individual one of the pads with first and second states of operation, the individual switch in each individual one of the pads providing in the first state

for the operation of the individual one of the vehicles only by such individual one of the pads and providing in the second state for the operation of the individual one of the vehicles by at least another one of the pads in addition to the individual one of the pads. No disclosure is further provided in either of the references of means in the central station for providing for the operation of the vehicle by the individual one of the pads and the at least additional one of the pads when the additional switch in the individual one of the pads is in the second state. Claim 2 is allowable over Yavetz and Stern for the same reasons as claim 1 because it is dependent from claim 1.

Claim 4 recites first means responsive in the central station to an operation of first switches in a plurality in an individual one of the pads in a pattern for producing first signals providing an address identifying any individual one of the vehicles. Claim 4 also recites third means responsive in the central station to the operation of a third switch in the plurality in the individual one of the pads for providing for an operation of the individual one of the vehicles by at least a second one of the pads simultaneously with the operation of the individual one of the vehicles by the individual one of the pads. There is also a recitation in claim 4 of fourth means in the central station for sending to the individual one of the vehicles the first signals providing, in the individual one of the pads and the at least second one of the pads, the address identifying the individual one of the vehicles and the second signals providing commands for obtaining the operation of the vehicle in accordance with

the pattern of closure of the second switches in the individual one of the pads and in the at least additional one of the pads.

Since claim 5 is dependent from claim 4, it is allowable over the combination of Yavetz and Stern for the same reasons as claim 4. Claim 5 is also allowable over each of Yavetz and Stern because neither reference discloses that the first means is responsive in the central station to the operation of the first switches in the at least second one of the pads in the pattern for producing in the at least second one of the pads signals providing an address identifying the individual one of the vehicles at the same time that the first signals are provided in the individual one of the pads to provide the address identifying the individual one of the vehicles.

Claim 9 recites certain features which are not disclosed in either Yavetz or Stern. For example, claim 9 recites means responsive in the vehicle to the identification of the addresses received from the pads as those of the vehicle for executing the received commands from the pads when the received commands from a pair of the pads are complementary. No disclosure is further provided in either of the references of means responsive in the vehicle to the identification of the addresses received from the pair of the pads as those of the vehicle for ignoring the commands received from the pads when the received commands are contradictory.



Claim 10 is dependent from claim 9 and is accordingly allowable over the combination of Yavetz and Stern for the same reasons as claim 9. Claim 10 is also allowable over each of Yavetz and Stern because of the recitation of means responsive in the vehicle to the discontinuance of one of the pads in the pair in addressing the vehicle for continuing the response of the vehicle to the addresses and commands from the other one of the pads in the pair.

There is a recitation in claim 18 that each individual one of a plurality of pads includes a plurality of switches having first and second states of operation for providing an address to select any individual one of the vehicles and for providing commands to such individual one of the vehicles for operating such individual one of the vehicles in accordance with such commands. Claim 18 also recites a central station responsive to the operation of the switches in the individual one of the pads in the first state for sending the commands to the individual one of the vehicles addressed by the individual one of the pads. There is also a recitation in claim 18 of first means including a memory in the central station for storing in the memory the identity of the individual one of the vehicles last addressed by the individual one of the pads. A recitation is also made in claim 18 of an additional switch disposed in the central station and having first and second states of operation for providing for the selection again, in the second state of operation of the additional switch, by such individual one of the pads of the individual one of the vehicles stored in the memory for such individual one of the pads after such individual one of the pads has selected one of the vehicles other than the

individual one of the vehicles or after the individual one of the pads has failed to provide a command to the individual one of the vehicles for a particular period of time. These features are not disclosed in either Yavetz or Stern.

Claim 19 is dependent from claim 18 and is accordingly allowable over Yavetz and Stern for the same reasons as claim 18. Claim 19 is additionally allowable over the combination of Yavetz and Stern because the references do not disclose that each of the pads includes a particular switch having first and second states of operation and operable to the second state on a repetitive basis for a particular number of times to select the individual one of the vehicles. The references also do not disclose second means responsive in the central station to the operation of the additional switch in the individual one of the pads in the second state and to the operation of any one of the further switches in the individual one of the pads to the second state, after such individual one of the pads has selected one of the vehicles other than the individual one of the vehicles or after the individual one of the pads has failed to provide a command to the individual one of the vehicles for a particular period of time, for providing for the addressing of the vehicle again by such individual one of the pads of such individual one of the vehicles.

Claim 28 also recites a central station responsive to the operation of the first switch in each of the pads in the second state for providing an address to any individual one of the vehicles dependent upon the number of such operations of the switch in such pad in

the second state. There is also a recitation in claim 28 of means responsive in the central station to the operation in the second state of the second switches providing in a pair of the pads contradictory commands to the individual one of the vehicles for converting such contradictory commands to signals providing specialized commands different from the commands provided by the operation of the different ones of the second switches in such pads. These features are not disclosed in either Yavetz or Stern.

Since claim 29 is dependent from claim 28, it is allowable over the combination of Yavetz and Stern for the same reasons as claim 28. Claim 29 is also allowable over each of Yavetz and Stern because it recites means in the central station for providing at each instant only the commands from the pads which are providing changes in addresses or commands at that instant and means in the central station for sending to the vehicles in the plurality the commands provided by the last mentioned means in the central station.

Claim 33 is allowable over the combination of Yavetz and Stern for certain important reasons. For example, claim 33 recites a plurality of pads each including a first switch having first and second states and operable in the second state to address any individual one of the vehicles dependent upon the number of operations of the first switch in the second state. Claim 33 is also patentably distinguished over Yavetz and Stern in reciting a central station and first means in the central station for interrogating the pads in the plurality to determine the number of operations of the first switch in the second state for

each of the pads. Furthermore, Yavetz and Stern do not disclose second means in the central station for providing, for each of the pads, a first plurality of signals providing an address for any of the vehicles dependent upon the number of operations of the first switch in such pad in the second state. Furthermore, the references do not disclose third means in the central station for providing a plurality of start signals at the particular rate. There is also no disclosure in either Yavetz or Stern of fourth means responsive in each of the vehicles to the start signals at the particular rate for operating upon the first plurality of signals in each of the pads at the particular rate to identify the address individual to such vehicle.

Claim 34 recites sixth means associated in the central station with the second means for providing for the transmittal to the vehicles by the second means at each instant only of the signals representing changes in addresses and commands from the pads at that instant. Neither Yavetz nor Stern discloses such sixth means. This causes claim 34 to be allowable over the combination of Yavetz and Stern. Claim 34 is also allowable over the combination of Yavetz and Stern because it is dependent from claim 33.

Claim 35 recites that each of the pads includes an additional switch having first and second states of operation and providing in the first state of operation for the addressing by such pad of one of the vehicles not addressed at that time by any of the other pads and providing in the second state of operation for the addressing of one of the vehicles addressed at that time by at least another one of the pads. Since this is not disclosed in either Yavetz or

Stern, claim 35 is allowable over these references because of such recitations. Claim 35 is also allowable over the combination of Yavetz and Stern because it is dependent from claim 33.

Claim 36 is allowable over the combination of Yavetz and Stern for a number of reasons. One reason is that claim 36 recites a central station and first means operatively coupled in the central station to the pads in the plurality for providing packets of signals identifying for each pad the individual one of the vehicles addressed by such pad. There is also a recitation in claim 36 of second means responsive in each of vehicle to the same identity of the signals providing the commands in two successive packets addressed to such vehicle by the first means in the central station for operating such vehicle in accordance with the pattern of the signals in such packets.

Because of its dependency from claim 36, claim 37 is allowable over the combination of Yavetz and Stern for the same reasons as claim 36. Claim 37 is also allowable over Yavetz and Stern because it recites means in the central station for interrogating the pads on a cyclic basis to obtain binary indications from each of the pads, on the cyclic basis with the other pads, of the individual one of the vehicles addressed by such pad and the binary indications providing commands for operating the individual one of the vehicles addressed by the pad.

Claim 38 is also dependent from claim 36 and is accordingly allowable over the combination of Yavetz and Stern for the same reasons as claim 36. Claim 38 is additionally allowable over Yavetz and Stern because neither reference discloses means in the central station for transmitting at each instant only the binary indications in the pads which are providing changes in addresses or commands at that instant.

In claim 39, there is a recitation of means in the central station for simultaneously interrogating the pads to obtain simultaneous binary indications from the pads of the individual ones of the vehicles addressed by such pads and the binary indications providing the commands for operating the individual ones of the vehicles. This is not disclosed in either Yavetz or Stern. Claim 39 is accordingly allowable over Yavetz and Stern because of such recitations. Claim 39 is also allowable over Yavetz and Stern because it is dependent from claim 38.

Claim 43 recites third means responsive in the vehicle to the failure of the vehicle to receive the first and second signals for a particular period of time for maintaining the same operation of the first and second motors in the vehicles for such particular period of time as the operation of the motors upon the last reception by the vehicle of the first and second signals from the central station. This is not disclosed in either Yavetz or Stern.

Since claim 44 is dependent from 43, it is allowable over Yavetz and Stern for the same reasons as claim 43. Claim 44 is additionally allowable over Yavetz and Stern because it recites fourth means responsive in the vehicle to the first and second signals received by the vehicles from the central station for accelerating the first and second motors in progressive increments to the speeds commanded by the central station to such motors for movement of the vehicle in the longitudinal direction.

Because of its dependency from claim 43, claim 45 is also allowable over the combination of Yavetz and Stern for the same reasons as claim 43. Claim 45 is also allowable over the combination Yavetz and Stern because neither reference discloses fourth means responsive in the vehicle to the first and second signals received by the vehicle from the central station for operating the first and second motors in accordance with such first and second signals only when the first means has received the same first and second signals from the central station a plurality of successive times.

Claim 46 is allowable over the combination of Yavetz and Stern because of certain recitations in the claim. For example, claim 46 recites that each of the pads provides first binary indications representing an address of any individual one of the vehicles. Claim 46 also recites a central station responsive to the first and second binary indications from the different pads for producing for each of the pads first signals providing an individual address for the individual one of the vehicles addressed by such pad. A recitation is additionally

made in claim 46 of means operative in each of the vehicles for continuing to provide a movement of such vehicle for a particular period of time in accordance with the last commands addressed to such vehicle by the central station when the vehicle fails to receive any commands addressed to such vehicle during the particular period of time. Claim 47 is allowable over the combination of Yavetz and Stern for the same reasons as claim 46 because it is dependent from claim 46.

Claim 48 recites means responsive in each of the vehicles to the commands addressed to the vehicle relating to movements of the vehicle at a particular speed for accelerating the vehicle in progressive increments to the particular speed. This is not disclosed in Yavetz or Stern. It causes claim 48 to be allowable over the references. Claim 48 is also allowable over the references because it is dependent from claim 46.

Claim 49 is allowable over the combination of Yavetz and Stern for a number of reasons specified above for claim 46. However, claim 49 recites that each of the pads in a plurality provides first binary indications representing a selection of any individual one of the vehicles. Claim 49 additionally recites a central station responsive to the first and second binary indications from the different pads for producing for each of the pads first signals providing an individual address for any individual one of the vehicles selected by such pad, the pads being connected to the central station. Claim 49 also recites that each of the vehicles includes a pair of left wheels spaced from each other in a longitudinal direction



and a pair of right wheels spaced from each other in a longitudinal direction and including a first motor for moving the left wheels and a second motor for moving the right wheels.

Claim 49 additionally recites second means responsive in each of the vehicles to the second and third signals received by the vehicle from the central station for accelerating the first and second motors in progressive increments to the speeds commanded by the central station to such motors for a movement of such vehicle in a longitudinal direction.

In claim 50 there is a recitation of third means responsive in each of the vehicles to the second and third signals received by such vehicle from the central station for a movement of such vehicle in the longitudinal direction for operating the first and second motors at the same speed, without any progressive increments in speed, when one of the motors in such vehicle has been previously operated at a different speed than the other motor in such vehicle, the same speed constituting the higher of the speeds provided by the first and second motors in such vehicle. This is not disclosed in either Yavetz or Stern. Claim 50 is accordingly allowable over Yavetz and Stern because of such recitation and also because it is dependent from claim 49.

Claim 51 is dependent from claim 50, thereby causing claim 51 to be allowable over the combination of Yavetz and Stern for the same reasons as claim 50. Claim 51 is additionally allowable over the combination of Yavetz and Stern because it recites means operative in each of the vehicles for continuing to operate the first and second motors for a

particular period of time in accordance with the last ones of the second and third signals received by the vehicle from the central station when the vehicle fails to receive the second and third signals addressed to the vehicle during such particular period of time.

There are certain recitations in claim 52 which cause the claim to be allowable over the combination of Yavetz and Stern. For example, claim 52 recites a central station responsive to first and second binary indications from the different pads for producing for each of the pads first signals providing an individual address for any individual one of the vehicles selected by the pad and second signals providing means for moving the vehicles in a particular direction and for operating the vehicle. A recitation is also made in claim 52 of second means responsive in each of the vehicles to the second signals addressed to the vehicles for determining whether successive ones of the second signals addressed to the vehicle are identical. Claim 52 additionally recites third means in each of the vehicles for operating the vehicle in accordance with the second signals addressed to the vehicle when the second means in the vehicle determines that the successive ones of the second signals addressed to the vehicle are identical. These features are not disclosed in either Yavetz or Stern.

Claim 53 further defines the third means in each of the vehicles as being operative to operate the vehicle in accordance with the second signals addressed to the vehicle in the second of the successive ones of the second signals addressed to the vehicle when the second

means in such vehicle determines that the successive ones of the second signals addressed to the vehicle are identical. This is not disclosed in Yavetz or Stern, thereby causing claim 53 to be allowable over this combination of references. Claim 53 is also allowable over each of Yavetz and Stern because it is dependent from claim 52.

Claim 54 is also dependent from claim 52 and is accordingly allowable over the combination of Yavetz and Stern for the same reasons as claim 52. Claim 54 is additionally allowable over the combination of Yavetz and Stern in the recitation that the first and second signals for each of the vehicles are in the form of packets each having a first particular number of the first signals and a second particular number of the second signals. There is also a recitation in claim 54 that fourth means determines whether at least a particular percentage of the packets addressed to each of the vehicles during a particular period of time has the first particular number of the first signals and the second particular number of the second signals in such packets. A recitation is additionally made in claim 54 of fifth means for operating each of the vehicles in accordance with the second signals in the packets addressed to the vehicle when the fourth means in the vehicle determines that at least a particular percentage of the packets addressed to the vehicle during the particular period of time has the first particular number of the first signals and the second particular number of the second signals in the packets. These features are not disclosed in either Yavetz or Stern. Claim 54 is accordingly allowable over the combination of Yavetz and Stern because of such recitations.

In claim 55 there is a recitation of a central station responsive to the first and second binary indications from the different pads for producing for each of the pads first signals providing an individual address for any individual one of the vehicles selected by the pad and second signals providing commands for moving such vehicle in a particular direction and for operating the vehicle. There is also a recitation in claim 55 of third means for operating each of the vehicles in accordance with the second signals in the packets addressed to the vehicle when the second means in each vehicle determines that at least a particular percentage of the packets addressed to the vehicle during the particular period of time has the second particular number of the second signals in the packets.

Since claim 56 is dependent from claim 55, it is allowable over the combination of Yavetz and Stern for the same reasons as claim 55. Claim 56 is additionally allowable over the combination of Yavetz and Stern because it recites that the central station is operative to interrogate each of the pads to determine the first and second binary indications from such pads. Claim 56 is further allowable over the combination of Yavetz and Stern because of the recitation of means in the central station for sending to the vehicles at each instant only the binary indications representing changes in the addresses or commands from the pads at that instant.

Claim 57 recites second means in the vehicle for determining whether successive ones of the second signals addressed to the vehicle are identical. There is also a recitation in claim 57 of third means in each of the vehicles for operating the vehicle in accordance with the second signals addressed to the vehicle when the second means in the vehicle determines that the successive ones of the second signals addressed to the vehicle are identical. These features are not disclosed in either Yavetz or Stern. This causes claim 57 to be allowable over the combination of Yavetz and Stern.

Claim 58 is dependent from claim 57 and is accordingly allowable over the combination of Yavetz and Stern for the same reasons as claim 57. Claim 58 is further allowable over the combination of Yavetz and Stern because it recites that the third means in each of the vehicles is operative to operate the vehicle in accordance with the second ones of the second signals addressed to the vehicle when the second means in the vehicle determines that the successive ones of the second signals addressed to the vehicle are identical.

Claim 59 is allowable over the combination of Yavetz and Stern for the same reasons as claim 57 because it is dependent from claim 57. Claim 60 is additionally allowable over the references because it recites sixth means for determining whether at least a particular percentage of the packets addressed to the vehicle during a particular period of time has a second particular number of the second signals in such packets. It is additionally allowable over the combination of Yavetz and Stern because of the recitation of seventh

means for operating the vehicle in accordance with the second signals in the packets addressed to the vehicle when the sixth means in the vehicle determines that at least the particular percentage of the packets addressed to the vehicle during the particular period of time has the second particular number of the second signals in the packets.

In claim 86 there is a recitation of a first line extending between a central station and a pad and having a first voltage at first particular times and having a second voltage at second particular times different from the first particular times. There is also a recitation in claim 86 of a second line extending between the central station and the pad to provide a transfer of information between the central station and the pad. Claim 86 additionally recites first means for interrogating the pad to determine the pattern of the first and second binary indications in the pad when the first line has the first voltage. Claim 86 additionally recites second means operative during the production of the first voltage on the first line for passing the first and second binary indications in the pad to the central station for the transmission by the central station to the vehicles of signals representing such first and second binary indications. A recitation is also made in claim 86 of third means operative during the production of the second voltage on the first line for transmitting to the pad through the second line from the central station signals identifying an individual one of the vehicles addressed by the first binary indications from the pad. These features are not disclosed in either Yavetz or Stern.

Because of its dependency from claim 86, claim 87 is allowable over the combination of Yavetz and Stern for the same reasons as claim 86. Claim 87 is additionally allowable over the combination of Yavetz and Stern because neither reference discloses that there are in the pad a plurality of lights each indicating, when illuminated, an individual one of the vehicles addressed by the pad and that means are responsive to the signals passing through the second line from the central station to the pad during the production of the second voltage on the first line for illuminating the light identifying the individual one of the vehicles addressed by the first binary indications from the pad.

In claim 88 there are a number of recitations which distinguish the claim from the combination of Yavetz and Stern. For example, claim 88 recites that each of the pads is connected to a central station for receiving power from the central station to provide first binary indications in addressing any individual one of the vehicles and second binary indications providing commands for operating the vehicles. Neither Yavetz nor Stern can address any one of the vehicles. Claim 88 also recites first means in the central station for interrogating each of the pads, separately from the interrogations of the other pads, to determine the first and second binary indications from the pad. There is also a recitation in claim 88 of second means in the pads for transmitting the first and second indications from the pads to the central station upon the interrogation of the pads by the central station. A recitation is also made in claim 88 of third means in the central station for transmitting to the vehicles the first and second binary indications determined from each of the pads. An

additional recitation is made in claim 88 that the central station and the pads are constructed to provide for a disconnection of any particular one of the pads from the central station and to provide for an addressing by any one of the pads other than the disconnected pad of the vehicle previously being addressed by the disconnected pad. Claim 88 also recites that the first means is operative to interrogate the other pads, without any interrogation of the particular one of the pads, instantaneously after the disconnection of the particular one of the pads from the central station. Claim 88 additionally recites that the second means in the pads is operative to transmit the first and second binary indications from the other pads in the central station, without any transmission of any indications from the particular one of the pads to the central station, instantaneously after the disconnection of the particular one of the pads from the central station. Claim 88 also recites that the third means in the central station is operative to transmit the first and second binary indications from the other pads to the vehicles, without any transmission by the third means of the binary indications from the particular one of the pads to the vehicles, instantaneously after the disconnection of the particular one of the pads from the central station. There is a further recitation in claim 88 of fourth means responsive in the central station instantaneously to the disconnection of the particular one of the pads from the central station for freeing the vehicle addressed by the particular one of the pads to receive from the central station first binary indications provided by any one of the other pads and representing the address of such vehicle and second binary indications provided by such one of the other pads and representing commands to such vehicle and for freeing the vehicle to be operated in accordance with such second binary



indications. The features specified above in claim 88 are not disclosed in either Yavetz or Stern.

Because of its dependency from claim 88, claim 89 is allowable over the combination of Yavetz and Stern for the same reasons as claim 88. Claim 89 is additionally allowable over the combination of Yavetz and Stern because it recites that the first means is operative to interrogate the pads in the plurality on a cyclic basis before the disconnection of the particular one of the pads from the central station and to interrogate the pads in the plurality, other than the particular one of the pads, on a cyclic basis instantaneously after the disconnection of the particular one of the pads from the central station.

Since claim 90 is dependent from claim 88, it is allowable over the combination of Yavetz and Stern for the same reasons as claim 88. Claim 90 is additionally allowable over the combination of Yavetz and Stern because of the recitation that the first means is operative to interrogate the pads in the plurality simultaneously before the disconnection of the particular one of the pads from the central station and to interrogate the pads in the plurality, other than the particular one of the pads, simultaneously and instantaneously after the disconnection of the particular one of the pads from the central station.

Claim 91 is also dependent from claim 88 and is accordingly allowable over the combination of Yavetz and Stern for the same reasons as claim 88. Claim 91 is also allowable over the combination of Yavetz and Stern because of the recitations in the claim. For example, claim 91 recites fifth means in each of the pads for providing for an illuminated indication in such pad of the individual one of the vehicles addressed by the pad. Claim 91 additionally recites sixth means in each of the vehicles for providing in such vehicle an illumination indicating the addressing of such vehicle. There is also a recitation in claim 91 of seventh means in the central station for discontinuing the illumination of the vehicle addressed by the particular one of the pads when the particular one of the pads is disconnected from the central station. A recitation is also made in claim 91 of eighth means in the central station for discontinuing the illuminated indication in the particular ones of the pads of the vehicle addressed by the particular one of the pads when the particular one of the pads is disconnected from the central station.

Since claim 96 is dependent from claim 1, it is allowable over the combination of Yavetz and Stern for the same reasons as claim 1. Claim 96 is additionally allowable over the combination of Yavetz and Stern because it recites that the pads in the plurality are connected to the central station and that means are provided in the central station for discontinuing the operation of the vehicle by the individual one of the pads instantaneously after the individual one of the pads is disconnected from the central station and for providing for the addressing of the vehicle by any one of the pads still connected to the central station.

Because of its dependency from claim 5, claim 97 is allowable over the combination of Yavetz and Stern for the same reasons as claim 5. Claim 97 is also allowable over the combination of Yavetz and Stern in the recitations that the pads in the pluralities are connected to the central station and that means in the central station provide for the operation of the individual one of the vehicles by any of the pads still connected to the central station instantaneously after the individual one of the pads is disconnected from the central station.

Claim 100 includes a number of recitations which cause the claim to be allowable over the combination of Yavetz and Stern. For example, claim 100 recites that pads in the plurality are connected to a central station and that first means are provided in the central station for interrogating the pads to determine the first and second binary indications from the pads. There is also a recitation in claim 100 of second means in the pads for transmitting the first and second binary indications from the pads to the central station and third means responsive in the central station to the identities of the first binary indications in successive transmissions of the first and second binary indications from each individual one of the pads to the central station for transmitting to the vehicles signals representing the first and second binary indications for such pad. An additional recitation is made in claim 100 of fourth means in the central station for providing a transmittal by the second means at each instant only of the second binary indications from the pads which are providing changes in address or commands at that instant. These features are not disclosed in either Yavetz or Stern.

Claim 101 is dependent from claim 100 and is accordingly allowable over the combination of Yavetz and Stern for the same reasons as claim 100. Claim 101 also recites that an additional pad is connected to the central station and that fifth means are provided in the central station for providing for an addressing by the additional pad of any of the vehicles not being addressed by the pads in the plurality and for providing for a transmission by the third means of the signals representing the first and second binary indications for the additional pad to the vehicles in the plurality instantaneously after the additional pad is connected to the central station. These features are not disclosed in either Yavetz or Stern.

Claim 102 recites that the first means in the central station is operative to interrogate the pads on a cyclic basis to obtain the binary indications from each of the pads, on the cyclic basis with the other pads, of the individual one of the vehicles addressed by the pad and the binary indications for providing commands for operating the individual one of the vehicles. This is not disclosed in either Yavetz or Stern. These recitations cause claim 102 to be allowable over the combination of Yavetz and Stern. Claim 102 is also allowable over the combination of Yavetz and Stern because it is dependent from claim 100.

In claim 103 there is a recitation that the first means in the central station is operative to simultaneously interrogate the pads to obtain simultaneously from the pads the first binary indications providing the addresses for the individual ones of the vehicles and the second binary indications providing the commands for operating the individual ones of

the vehicles. These recitations cause claim 103 to be allowable over the combination of Yavetz and Stern. Claim 103 is also allowable over the combination of Yavetz and Stern because it is dependent from claim 100.

Claim 108 recites a plurality of pads each operative to provide an address for selecting any individual one of the vehicles. Claim 108 also recites that the pads are connected to a central station and that first means are provided in the central station for interrogating the pads to determine the address and commands provided by the pads. There is also a recitation in claim 108 of second means responsive in the central station to the interrogation provided by the first means in the central station concerning the address and the commands from each pad for receiving the address and the commands from such pad and for transmitting to the vehicles signals representing the address and the commands from such pads. A recitation is also made in claim 108 of third means responsive in the central station to any change in the address or commands from an individual one of the pads for transmitting the address and commands from such pad to the vehicles in the plurality on a priority basis relative to the address and commands from the other pads in the plurality. These recitations cause claim 108 to be allowable over the combination of Yavetz and Stern.

In claim 109 there is a recitation that the central station discontinues an interrogation of any pad which is disconnected from the central station instantaneously after the pad is disconnected from the central station. Claim 109 additionally recites that the

central station provides for the addressing by any of the pads still connected to the central station of the vehicle previously addressed by the disconnected pad. These recitations are not disclosed in either Yavetz or Stern, thereby causing claim 109 to be allowable over the combination of Yavetz and Stern. Claim 109 is also allowable over the combination of Yavetz and Stern because it is dependent from claim 108.

Because of its dependency from claim 108, claim 110 is allowable over the combination of Yavetz and Stern for the same reasons as claim 108. Claim 110 is additionally allowable over the combination of Yavetz and Stern because of the recitation that the central station transmits the address and commands from the individual one of the pads in the plurality to the vehicles in the plurality only when the central station has completed the transmission to the vehicles in the plurality of the address and commands of the pad whose address and commands the central station has been transmitting at the time that the central station receives the change in the address and the commands from the individual one of the pads in the plurality.

8. Claim 3 has been rejected under 35 U.S.C. 103(a) as being unpatentable over Yavetz in view of Stern as applied to claim 2 and further in view of Rosenhagen. Since claim 3 is dependent from claim 2, it is allowable over the combination of Yavetz and Stern for the same reasons as claim 2. Claim 3 is also allowable over Rosenhagen for the same reasons. Claim 3 is additionally allowable over Rosenhagen because Rosenhagen does not

disclose means responsive in the central station to the operation of the additional one of the switches in the individual one of the pads in the second state and to the operation of the first switches in the individual one of the pads and the at least additional one of the pads for providing movements of the individual one of the vehicles in accordance with the operation of the first switches in the individual one of the pads and the additional one of the pads.

There is also no disclosure in either Yavetz or Stern that such means is responsive in the central station to the operation of the second switches in the individual one of the pads and the additional one of the pads for providing operations of the individual one of the vehicles other than the movements of such vehicle in accordance with the operation of the second switches in the individual one of the pads and the additional one of the pads.

The Examiner has indicated as follows on page 6 of the Office Action dated July 8, 1998:

“It would have been obvious to have provided a Yavetz toy with the ability to control any vehicle, as taught by Rosenhagen, in order to make the “conflict” more of a challenge by enabling a player to “capture” one or more of the “enemy” vehicles.”

Applicant respectfully disagrees with the Examiner that Rosenhagen has the ability to control any vehicle. Applicant would appreciate it if the Examiner would specify in the next Office Action where in his specification Rosenhagen provides such a disclosure.

9. Claims 11-13, 23-27, 30, 32, 104-107, 138, 139, 141, 150 and 151 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Rosenhagen in view of Stern. On page 6 of the Office Action dated July 8, 1998, the Examiner attempts to provide a basis in the following language for the rejection of these claims:

“Rosenhagen lacks the use of central station to reduce transmitters, as is taught by Stern. It would have been obvious to have provided a Rosenhagen set with a central station, as taught by Stern, in order to reduce the number of transmitters required in the set and thereby reduce costs.”

The Examiner has admitted that Rosenhagen does not provide a central station. It is moot whether or not Stern discloses a central station since neither Rosenhagen nor Stern discloses a number of features recited in each of claims 11-13, 23-27, 30, 32, 104-107, 138, 139, 141, 150 and 151. By way of illustration, claim 23 recites a plurality of pads each operative to provide an address for selecting any individual one of the vehicles and a central station, the pads being connected to the central station. There is also a recitation in claim 23



of first means in the central station for interrogating the pads to determine the addresses and the commands provided by the pads. A recitation is also made in claim 23 of second means responsive in the central station to the interrogation provided by the first means in the central station concerning the address and the commands from each pad for sending the address and commands from the pad to the vehicle addressed by the pad to obtain an operation of such vehicle in accordance with such commands. A recitation is further made in claim 23 that the first means in the central station is operative to interrogate any additional pad connected to the central station at the instant that such additional pad is connected to the central station. Claim 23 additionally recites that the second means is responsive in the central station to the interrogation provided by the first means in the central station concerning the address and the commands from the pads in the plurality and from the additional pad for sending signals representing the address and commands from each such pad to the vehicle addressed by such pad, instantaneously after the additional pad is connected to the central station, to obtain an operation of such vehicle in accordance with such commands without affecting the interrogation of the pads in the plurality by the central station. These features are not disclosed in either Rosenhagen or Stern.

Because of its dependency from claim 23, claim 24 is allowable over the combination of Rosenhagen and Stern for the same reasons as claim 23. Claim 24 is additionally allowable over the combination of Rosenhagen and Stern because it recites third means in a central station for providing for a sending at each instant by the second means of

only the commands from the pads which are providing changes in addresses or commands at that instant.

Claim 25 is dependent from claim 23 and is accordingly allowable over the combination of Rosenhagen and Stern for the same reasons as claim 23. Claim 25 is further allowable over the combination of Rosenhagen and Stern because it recites that the first means is operative to eliminate from interrogation by the central station any one of the pads disconnected in the plurality from the central station and to provide such elimination at the instant that the pad is disconnected from the central station and without affecting the interrogation of the other pads by the central station and to provide for the addressing by any of the pads, other than the disconnected pad, of the vehicle previously addressed by the disconnected pad.

There are certain features which distinguish claim 26 over the combination of Rosenhagen and Stern. For example, claim 26 recites a central station and pads connected to the central station and operative to provide an address for selecting any individual one of the vehicles. Claim 26 also recites first means in the central station for interrogating the pads to determine the address and commands provided by the pads. Claim 26 additionally recites second means responsive in the central station to the interrogation provided by the first means in the central station concerning the address and the commands from each pad for sending signals representing the address and the commands from such pad to the vehicle

addressed by such pad to obtain an operation of such vehicle in accordance with such commands. Claim 26 further recites that the first means in the central station is operative to eliminate, from the interrogation, any one of the pads disconnected in the plurality from the central station and to provide such elimination at the instant that the pad is disconnected from the central station and to provide such elimination without affecting the interrogation of the other pads by the central station and to provide for an addressing by any pad, other than the disconnected pad, of the vehicle previously addressed by the disconnected pad. Neither Rosenhagen nor Stern discloses these features.

Claim 27 is dependent from claim 26 and is accordingly allowable over the combination of Rosenhagen and Stern for the same reasons as claim 26. Claim 27 is additionally allowable over the combination of Rosenhagen and Stern because it recites third means in the central station for providing for the transmission at each instant by the second means only of the commands from the pads which are providing changes in addresses or commands at that instant.

Claim 30 is patentable over the combination of Rosenhagen and Stern for a number of reasons. For example, neither reference discloses a central station responsive to the addresses and commands from the handheld pads for providing for each of the pads a first plurality of signals representing the address of any individual one of the vehicles and a second plurality of signals representing the commands for operating such individual one of

the vehicles, the first and second pluralities of signals provided at the central station for each of the pads occurring at a particular rate selected in a particular range of rates. The claim also recites that the central station also provides a plurality of start signals at the particular rate. There is an additional recitation in claim 30 of means responsive in each of the vehicles to the start signals from the central station for determining the particular rate of occurrence of the start signals and for providing for the response of the first means in the vehicle, at the particular rate of occurrence of the start signals, to the first signals representing the individual address of the vehicle and to the second signals providing commands for the vehicle. These features are not disclosed in either Rosenhagen or Stern.

Claim 32 is dependent from claim 30 and is accordingly allowable over the combination of Rosenhagen and Stern for the same reasons as claim 30. Claim 32 is additionally allowable over the combination of Rosenhagen and Stern because it recites that the central station is operative in a first mode to provide for the addressing of each individual one of the vehicles by only one of the pads in the plurality and is operative in a second mode to provide for the addressing of each individual one of the vehicles by at least two (2) of the pads in the plurality.

Claim 104 recites certain features which cause the claim to be patentable over the combination of Rosenhagen and Stern. For example, the claim recites third means responsive in the central station to the identification of the addresses received from the pads

as those of the vehicle for providing for an execution of the received commands by the vehicle in accordance with such commands when the identified commands are complementary. There is also a recitation in the claim of fourth means responsive in the central station to the identification of the addresses received from the pads as those of the vehicle for providing for an execution by the vehicle of commands different from the commands provided by the pads when the commands are contradictory. These recitations distinguish the claim over the combination of Rosenhagen and Stern.

Because of its dependency from claim 104, claim 105 is allowable over the combination of Rosenhagen and Stern for the same reasons as claim 104. Claim 105 is additionally allowable over the combination of Rosenhagen and Stern because there is no disclosure in either reference of fifth means responsive in the vehicle to the discontinuance of one of the pads in the plurality in addressing the vehicle for continuing the response of the vehicle to the addresses and commands from the pads still addressing the vehicle.

Claim 106 is dependent from claim 23 and is accordingly allowable over the combination of Rosenhagen and Stern for the same reasons as claim 23. Claim 106 is additionally allowable over the combination of Rosenhagen and Stern because of the recitation that the first means is operative to interrogate the pads in the plurality and the additional pad on a cyclic basis and that the second means is responsive on the cyclic basis to the interrogation provided by the first means of the pads in the plurality and the additional

pad for sending the addresses and commands to the addressed vehicles to obtain an operation of such vehicles in accordance with such commands.

Claim 107 recites that the first means is operative to interrogate the pads in the plurality and the additional pads simultaneously and that the second means is responsive to the simultaneous interrogation provided by the first means of the pads in the plurality and the additional pad for sending the addresses and commands to the addressed vehicles to obtain an operation of such vehicles in accordance with such commands. Claim 107 is also allowable over the combination of Rosenhagen and Stern because it is dependent from allowable claim 23.

10. Claim 40 has been rejected under 35 U.S.C. 103(a) as being unpatentable over Mabuchi in view of Stern. Claim 40 is allowable over the combination of Mabuchi and Stern because neither reference discloses third means responsive in the vehicle to the first and second signals received by the vehicle from the central station for operating the first and second motors at the same speed, without any progressive increments in speed, for movement of the vehicle in the longitudinal direction when one of the motors has been previously operated at a different speed than the other motor, the same speed constituting the higher of the speeds provided by the first and second motors.

11. Claim 41 has been rejected under 35 U.S.C. 103(a) as being unpatentable over Mabuchi in view of Stern as applied to claim 40 and further in view of Rosenhagen. Claim 41 is allowable over the combination of Mabuchi, Stern and Rosenhagen for the same reasons as claim 40 because it is dependent from claim 40. This is particularly true since Rosenhagen does not disclose the third means specified above as distinguishing claim 40 over the combination of Mabuchi and Stern. Claim 41 is additionally allowable over the combination of Mabuchi, Stern and Rosenhagen because none of the references discloses fourth means responsive in the vehicle to the first and second signals received by the vehicle from the central station for converting the first and second signals to pulse width modulations in progressive periods of time, the pulse width modulations for each of the first and second motors at each instant having duty cycles dependent upon the speed at which such motor is to be operated at that instant. Claim 41 is additionally allowable over the combination of Mabuchi, Stern and Rosenhagen because it recites that the operation of the second and third means at each instant is dependent upon such pulse width modulations at that instant in the duty cycles of the pulse width modulations at that instant.

12. Claim 42 has been rejected under 35 U.S.C. 103(a) as being unpatentable over Mabuchi in view of Stern as applied to claim 40 and further in view of Yang. Claim 42 is allowable over the combination of Mabuchi, Stern and Yang because none of the references discloses the third means specified above in claim 40 and because claim 42 is dependent from claim 40. Claim 42 is additionally allowable over the combination of

Mabuchi, Stern and Yang because none of the references discloses, in the combination recited in claim 40, fourth means responsive in the vehicle to the failure of the vehicle to receive the first and second signals for a particular period of time for maintaining the same operation of the first and second motors for such particular period of time as the operation of such motors upon the last reception by the vehicle of the first and second signals from the central station. Contrary to the position of the Examiner, not even Yang discloses the fourth means recited in claim 42.

13. Claims 63-85, 98 and 99 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Yavetz in view of Stern and Yang. Claim 63 is allowable over the combination of Yavetz, Stern and Yang for certain important reasons. For example, none of the references discloses a first line extending between a microcontroller in a central station and the pads in the plurality to provide an interrogation by the central station of such pads with respect to the first and second binary indications from the pads. There is also no disclosure in any of the references of a second plurality of lines each extending between the microcontroller and an individual one of the pads for providing clock signals from the central station to the individual one of the pads for controlling the time of the interrogation of the individual one of the pads by the central station. There is additionally no disclosure in any of the references of a plurality of third lines each extending between the microcontroller and an individual one of the pads for providing the first and second binary indications from the individual one of the pads to the central station in response to the interrogation by the



central station to the individual one of the pads. Since none of the references provides these features, they cannot be combined to reject claim 63.

Claim 64 is dependent from claim 63 and is accordingly allowable over the combination of Yavetz, Stern and Yang for the same reasons as claim 63. Claim 64 is also allowable over the combination of Yavetz, Stern and Yang because none of the references discloses that the lines in the second plurality introduce the clock signals in sequence to the different ones of the pads on a cyclic basis to obtain an interrogation of the pads by the central station when the pads receive the clock signals. None of the references further discloses that the lines in the third plurality provide the first and second binary indications from the pads to the central station when the pads are interrogated by the central station.

Because of its dependency from claim 63, claim 65 is allowable over the combination of Yavetz, Stern and Yang for the same reasons as claim 63. Claim 65 is also allowable over the combination of Yavetz, Stern and Yang because of the recitation that the lines in the second plurality introduce the clock signals simultaneously to the different ones of the pads to obtain a simultaneous interrogation of the different pads by the central station and that the lines in the third plurality provide the first and second binary indications from the pads when the pads are interrogated by the central station.

Claim 66 recites that the clock signals have first and second polarities and that the interrogation of the pads in the plurality by the central station occurs when the clock signals on the lines in the second plurality have a particular one of the first and second polarities. This is not disclosed in any of the cited references. This causes claim 66 to be allowable over the combination of the cited references, particularly in the combination recited in claim 63. Claim 66 is also allowable over the combination of Yavetz, Stern and Yang because it is dependent from claim 63.

Claims 67-70 are allowable over the combination of Yavetz, Stern and Yang for reasons corresponding to those discussed above with respect to claims 63-66. For example, none of the references discloses a first line extending between a central station and pads in a plurality to provide an interrogation of such pads by the central station of the first and second binary indications from the pads. There is also no disclosure in any of Yavetz, Stern and Yang of a second plurality of lines each extending between the central station and an individual one of the pads for providing clock signals from the central station to the individual one of the pads for controlling the time of the interrogation of such individual one of the pads by the central station. No disclosure is further provided in any of Yavetz, Stern and Yang of a third plurality of lines each extending between the central station and an individual one of the pads for providing the first and second binary indications from the individual one of the pad to the central station in response to the interrogation by the central station to the individual one of the pads. None of the references further discloses that the

lines in the third plurality also provide binary indications from the central station to each individual one of the pads in the plurality, after the provision of the first and second binary indications from such individual one of the pads to the central station, of the particular one of the vehicles addressed by each individual one of the pads. By way of illustration, these features are recited claim 67.

Claim 68 recites that the lines in the third plurality provide the first and second binary indications from the pads to the central station when the pads are interrogated by the central station. Claim 68 also recites that each of the pads has a plurality of lights each indicating a different one of the vehicles and means for illuminating a particular one of the lights on each of the pads in accordance with the particular one of the vehicles addressed by such pad. Since none of Yavetz, Stern and Yang discloses these features, claim 68 is allowable over this combination of references. Claim 68 is also allowable over this combination of references because it is dependent from claim 67.

Since claim 69 is dependent from claim 67, it is allowable over the references for the same reasons as claim 67. Claim 69 additionally recites that the lines in the second plurality introduce the clock signals simultaneously to the different ones of the pads to obtain a simultaneous interrogation of the different pads by the central station and that the lines in the third plurality provide the first and second binary indications from the pads when the pads are interrogated by the central station. There is also a recitation in claim 69 that

each of the pads has a plurality of lights each indicating a different one of the vehicles and that means are provided for illuminating a particular one of the lights on each of the pads in accordance with the particular one of the vehicles addressed by such pad. These features are not disclosed in any of Yavetz, Stern or Yang.

Claim 70 is dependent from claim 69 and is accordingly allowable over the combination of Yavetz, Stern and Yang for the same reasons as claim 69. Claim 70 is also allowable over these references because it recites that the clock signals have first and second polarities and that the interrogation of the pads by the central station occurs when the clock signals on the lines in the second plurality have a particular one of the first and second polarities. Claim 70 is also allowable over the references because it recites that the illumination of the particular one of the lights on each of the pads by the indications from the central station to such pad through the lines in the third plurality for such pad in representation of the particular one of the vehicles addressed by such pad occur when the clock signals on the lines in the second plurality have the other one of the first and second polarities.

In claim 71 there is a recitation of features not disclosed in any of Yavetz, Stern or Yang. For example, there is a recitation in claim 71 of a first line extending between the central station and the pads in the plurality to provide an interrogation by the central station of such pads with respect to the first and second binary indications from such pads. Claim

71 additionally recites a plurality of second lines each extending between the central station and an individual one of the pads for providing clock signals from the central station to the individual one of the pads for controlling the time of interrogation of the individual one of the pads by the central station. A recitation is also made in claim 71 of a plurality of third lines each providing an indication from the central station to the individual one of the pads of the vehicle addressed by such individual one of the pads. This combination of features is not disclosed in any of Yavetz, Stern and Yang or in any combination of these references.

Because of its dependency from claim 71, claim 72 is allowable over the combination of Yavetz, Stern and Yang for the same reasons as claim 71. Claim 72 is additionally allowable over this combination of references because it recites that each of the third lines provides the first and second binary indications in an individual one of the pads to the central station in a first polarity of clock signals and each provides an indication from the central station to the individual one of the pads, in the second polarity of the clock signals, of the vehicle addressed by such individual one of the pads.

Claim 73 recites that the second lines introduce the clock signals in sequence to the different ones of the pads on a cyclic basis to obtain an interrogation of the pads by the central station when the pads receive the clock signals. A recitation is also made in claim 73 that the third lines provide in sequence the indications from the central station to the individual one of the pads of the vehicles addressed by such individual ones of the pads

when the pads are interrogated by the central station. These features are not disclosed in any of the references. This causes claim 73 to be allowable over the combination of the cited references. Claim 73 is also allowable over the combination of the cited references because it is dependent from claim 72.

Because of its dependency from claim 71, claim 74 is allowable over the combination of Yavetz, Stern and Yang for the same reasons as claim 71. Claim 74 is also allowable over the combination of Yavetz, Stern and Yang because it recites a plurality of lights in each of the pads, each of the lights providing an indication, when illuminated, of an individual one of the vehicles. Neither Yavetz, Stern or Yang further discloses means for illuminating an individual one of the lights in each of the pads in accordance with the indication from the central station to the pad of the vehicle addressed by the pad.

With respect to any alleged illumination by Yavetz, applicant refers the Examiner to the discussion in paragraph 5 of the Remarks and in subparagraph (o) of paragraph 7 in the Remarks relating to differences between applicant's invention on the one hand and Stern and Yavetz on the other hand. Furthermore, any such illumination by Yavetz is provided in a vehicle and not in a pad controlling the operation of the vehicle.

Since claim 75 is dependent from claim 72, it is allowable over the combination of Yavetz, Stern and Yang for the same reasons as claim 72. Claim 75 is also allowable over this combination of references in the recitation that the second lines introduce the clock signals simultaneously to the different ones of the pads to obtain a simultaneous interrogation of the different pads by the central station and that the third lines provide the first and second binary indications simultaneously from the central station to the individual ones of the pads of the vehicles addressed by such individual ones of the pads when the pads are interrogated by the central station.

Much of the recitation in claim 76 corresponds to the recitation in claim 63. However, claim 76 includes an additional recitation that the extension of the third lines between the central station and the pads provides for the de-coupling of any one of the pads from the central station without affecting the provision of the first and second binary indications from the other ones of the pads to the central station. This is not disclosed in any of Yavetz, Stern or Yang.

Claim 77 is dependent from claim 76 and is accordingly allowable over the combination of Yavetz, Stern and Yang for the same reasons as claim 76. Claim 77 is further allowable over the combination of Yavetz, Stern and Yang because of the recitation that each of the third lines provides an indication from the central station to the individual one of the pads of the vehicle addressed by such individual one of the pads. Claim 77 is also

allowable over the references because it recites that the extension of the third lines between the central station and the pads provides for a de-coupling of any one of the pads from the central station and for an elimination of the indication in the pad of the vehicle addressed by the pad without affecting the provision of the indications from the central station to the other pads of the vehicles addressed by such other ones of the pads and that such extension provides for the addressing of the vehicle by any of the other pads.

Claims 78 and 79 are respectively dependent from claims 76 and 77 and are accordingly allowable over the combination of Yavetz, Stern and Yang for the same reasons as discussed above with respect to claims 76 and 77. Claims 78 and 79 additionally recite that the extensions of the third lines between the central station and the pads provide for the extensions of additional third lines between additional pads and the central station to provide first and second binary indications from each of such additional pads to the central station in response to interrogations by the central station to the individual ones of such additional pads without affecting the provision of the first and second binary indications from the pads in the plurality to the central station and without affecting the provision of the indications from the central station to the pads in the plurality of the vehicles addressed by such pads in the plurality. Claims 78 and 79 further recite that such binary indications are provided at the instant that such extensions of the additional third lines are provided between the additional pads and the central station. These features are not disclosed in any of the references.



Claims 80 and 81 are allowable over the combination of Yavetz, Stern and Yang for a number of the same reasons as discussed above with respect to claims 63-79. In addition, claims 80 and 81 are allowable over this combination of references in the recitation that the extensions of the third lines between the central station and the pads providing for the extensions of additional third lines between the additional pads and the central stations provide first and second binary indications from each of such additional pads to the central station in response to interrogations by the central station to the individual ones of such additional pads without affecting the provision of the first and second binary indications from the pads in the plurality to the central station and without affecting the provision of the indications from the central station to the pads in the plurality of the vehicles addressed by such pads in the plurality to provide such binary indications at the instant that such extensions of the additional third lines are provided between the additional pads and the central station.

Claim 82 provides recitations corresponding to those made in claim 63 and accordingly is allowable over the combination of Yavetz, Stern and Yang for substantially the same reasons as claim 63. However, claim 82 relates to only a single pad rather than to a plurality of pads as in claim 63. Furthermore, claim 82 recites first means for storing the first and second binary indications in the pad and second means associated with the second and third lines for providing a transfer of the binary indications in the first means to the third line in synchronism with the clock signals on the second line when an interrogation of such

pad is provided on the first line. Claim 82 is accordingly allowable over the combination of Yavetz, Stern and Yang for substantially the same reasons as claim 63 and is further allowable over this combination of references because of the recitation of the first and second means.

Claim 83 additionally recites that the first means stores the first and second binary indications in the pad in a parallel form and the second means transfers the binary indications in the first means to the third line in a serial form. This is not disclosed in any of Yavetz, Stern or Yang, thereby causing claim 83 to be allowable over this combination of references. Claim 83 is also allowable over the combination of Yavetz, Stern and Yang for the same reasons as claim 82 because it is dependent from claim 82.

Claim 84 recites that the first line provides a first voltage to provide an interrogation of the first and second binary indications in the pad in synchronism with the clock signals on the second line and that the central station provides through the first line to the pad signals identifying the vehicle selected by the pad. There is also a recitation in claim 84 that the central station provides such identifying signals to the pad in synchronism with the clock signals on the second line during the time that a second voltage different from the first voltage is produced on the first line. None of Yavetz, Stern and Yang discloses this relationship. This causes claim 84 to be allowable over the combination of Yavetz, Stern

and Yang. Claim 84 is also allowable over this combination of references because it is dependent from claim 82.

Because of its dependency from claim 84, claim 85 is allowable over the references for the same reasons as claim 84. Claim 85 is also allowable over the combination of references because of the recitation that the pad provides a plurality of lights each indicating, when illuminated, the addressing of such vehicle by the pad and that means are provided for illuminating a particular one of the lights in accordance with the signals passing through the third line from the central station to the pad.

Since claim 98 is dependent from claim 66, it is allowable over the combination of Yavetz, Stern and Yang for the same reasons as claim 66. Claim 98 is also allowable over the combination of Yavetz, Stern and Yang because of the recitation that the central station provides indications, through the third line for each of the pads, to such pad of the individual one of the vehicles addressed by the pad. Claim 98 is additionally allowable over the combination of Yavetz, Stern and Yang in the recitation that means are provided in each of the pads for indicating the individual one of the vehicles addressed by such pad in accordance with the indications provided by the central station to such pad through the third line for such pad.

Claim 99 provides recitations similar to the recitations in claim 98. This causes claim 99 to be allowable over the combination of Yavetz, Stern and Yang for the same reasons as claim 98. Claim 99 is further allowable over this combination of references for the same reasons as claim 75 because it is dependent from claim 75.

14. Claims 122-128, 148 and 149 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Yavetz in view of Stern and Rosenhagen. Claim 122 is allowable over this combination of references for certain important reasons. For example, none of the references discloses a plurality of pads each operative to provide an address for selecting any individual one of the vehicles. None of the references further discloses first means in a central station for interrogating the pads connected to the central station to determine the address and the commands provided by such pads. There is also no disclosure in any of the references of second means responsive in the pads to the interrogation by the central station for transmitting the address and the commands from the pads to the central station. No disclosure is further provided in any of the references of third means in the central station for receiving the addresses and the commands transmitted by the pads to the central station and fourth means in the central station for transmitting to the vehicles in the plurality only the address and commands transmitted from each pad to the central station that are different from the immediately preceding address or commands transmitted by such pad to the central station.

Since 123 is dependent from claim 122, it is allowable over the combination of Yavetz, Stern and Rosenhagen for the same reasons as claim 122. Claim 123 is also allowable over this combination of references because it recites that the first means in the central station is operative to interrogate the pads simultaneously and that the pads are operative to transmit the addresses and the commands from the pads to the central station when interrogated.

Claim 124 is allowable over the combination of Yavetz, Stern and Rosenhagen for a number of important reasons. One reason is that none of the references discloses a plurality of pads each operative to provide an address for selecting any individual one of the vehicles and a central station. None of the references further discloses a plurality of first switches each included in an individual one of the pads and having first and second states of operation and operative in the first state a successive number of times to address any individual one of the vehicles. There is also no disclosure in any of Yavetz, Stern and Rosenhagen that each of the pads includes a plurality of lights each indicating an individual one of the vehicles when illuminated. There is also no disclosure in any of Yavetz, Stern and Rosenhagen of first means in the central station for remembering at each instant the individual ones of the vehicles being addressed by the pads at that instant and a plurality of second switches each having first and second operative relationships and each disposed in an individual one of the pads and each operative in the first relationship to provide for the addressing of only one of the vehicles by such individual one of the pads and operative in

the second relationship to provide for the addressing by any other one of the pads of the vehicle simultaneously being addressed by such individual one of the pads. No disclosure is further provided in any of the references of second means responsive in each of the pads to the operation of the first means in the central station and to the operation of the second switch in each pad in the first relationship for skipping over the lights representing in each pad the vehicle as being addressed by the other pads when the first switch in such pad receives successive actuations to the first state of operation. None of the references additionally discloses third means responsive in the other one of the pads to the operation in the first means in the central station and to the operation of the second switch in the individual one of the pads in the second relationship for including, in the sequence of lights in such other one of the pads, the light in the vehicle addressed by such individual one of the pads in the second state of operation of the second switch in such individual one of the pads even when such vehicle is simultaneously being addressed by another one of the pads.

Claim 125 is dependent from claim 124 and is accordingly allowable over the combination of Yavetz, Stern and Rosenhagen for the same reasons as claim 124. Claim 125 is additionally allowable over this combination of references because of the recitation of means in the central station for transmitting the address and commands from the individual one of the pads and the other one of the pads to the vehicle addressed by such individual one of the pads when the second switch in the individual one of the pads is in the second state of operation.

Claim 126 includes a number of recitations which distinguish patentably over the combination of Yavetz, Stern and Rosenhagen. For example, claim 126 recites a plurality of pads each operative to provide an address for selecting any individual one of the vehicles and to provide commands to such individual one of the vehicles for operating such individual one of the vehicles in accordance with such commands. Claim 126 also recites that each individual one of the vehicles has a light for illumination when such vehicle is addressed and commanded by the central station as a result of the address and commands from an individual one of the pads. Claim 126 additionally recites first means in the central station for storing the addressing by each individual one of the pads of the individual one of the vehicles and second means in the central station for communicating a command to the individual one of the vehicles to extinguish the light in such vehicle instantaneously after the individual one of the pads providing the address and the commands to such individual one of the vehicles becomes disconnected from the central station. Claim 126 additionally recites third means in each individual one of the vehicles for extinguishing the light in such individual one of the vehicles in accordance with the communication from the central station. These features are not disclosed in any of Yavetz, Stern and Rosenhagen.

Claim 127 recites fourth means in the central station for eliminating the storage of the addressing by each individual one of the pads of the individual one of the vehicles instantaneously after such individual one of the pads becomes disconnected from the central station. This is not disclosed in any of Yavetz, Stern or Rosenhagen. This causes claim 127

to be allowable over the cited prior art. Claim 127 is also allowable over the cited prior art because it is dependent from claim 126.

Because of its dependency from claim 127, claim 128 is allowable over the cited references for the same reasons as claim 127. Claim 128 is additionally allowable over the cited references because it recites fifth means in the central station for interrogating the pads connected to the central station to determine the address and the commands from such pad to the vehicles and sixth means for receiving in the vehicles from the central station the address and the commands provided by each of the pads upon the interrogation of such pad by the central station. There is also a recitation in claim 128 of seventh means in the central station for eliminating one of the pads from the interrogation by the central station, instantaneously after the pad becomes disconnected from the central station, without affecting the interrogation of the other pads by the central station and for providing for the addressing by any of the other pads of the vehicle previously addressed by the disconnected pad.

Claim 148 recites a plurality of pads each operative to provide addresses individual to any one of the vehicles in a plurality. Claim 148 also recites a central station operatively coupled to the pads for receiving the addresses and the commands from the pads and for transmitting such addresses and commands to the vehicles in packets each composed of a plurality of binary indications representing the address and the commands for any individual one of the vehicles and each having start bits at the beginning of the packet and



having the address and commands following the start bits, the packets from the different pads in the plurality following one another with no time separation between successive ones of the packets. There is also a recitation in claim 148 of means in the central station for transmitting the packets of the binary indications to the vehicles. A recitation is also provided in claim 148 of means in the central station for regulating the rate of transmitting the bits in the packets to the vehicles in accordance with the time between the start bits in the successive packets of the binary information. These features are not disclosed in any of Yavetz, Stern or Rosenhagen, thereby causing claim 148 to be allowable over this combination of references. Claim 149 is allowable over the combination of references for the same reasons as claim 148 because it is dependent from claim 148.

15. Claims 152-164 have been added by this amendment. Claims 155-158 recite a system in which a member is actuatable a sequential number of times in an individual one of the pads in a plurality to address any one of a plurality of vehicles dependent upon the number of such actuations and in which the binary indications of vehicles already being addressed by other pads then the individual one of the pads are skipped in the individual one of such pads during such sequential activations of the member. Claims 156 and 158 additionally recite that there are in each pad a plurality of light illuminating members each one for a different one of the vehicles and that the light illuminating members indicating the vehicles already being addressed by the others of the pads are skipped when the member in

the pad is actuated the sequential number of times. These features are not disclosed in any of the references cited by the Examiner.

Claims 159-164 recite a system in which a plurality of pads are provided with an address to select any individual one of the vehicles in a plurality and in which the pads are interrogated simultaneously by a central station. Claims 159-164 additionally recite that the pads transmit to the central station binary indications of the states of operation of members operable in the pads to indicate addresses and commands to the vehicles. Claims 160 and 163 additionally recite that the pads simultaneously transmit to the central station the binary indications of the address and commands from the pads to the vehicles. There is a recitation in claims 161 and 164 that the central station sequentially transmits to the vehicles in the plurality signals representing the binary indications from the different ones of the pads. None of the references discloses these features.

16. In order for different prior art references to be combined, to reject a claim, the references have to disclose or suggest the combination recited in the claim. ACS Hospital Systems, Inc. v. Montefiore Hospital, 1732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed. Cir. 1984). As the Federal Circuit indicated in the ACS case:

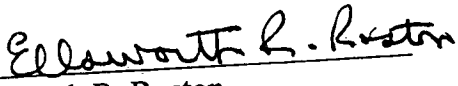
Serial No. 08/797,188

“Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching or suggestion supporting the combination. Under Section 103, teachings of references can be combined only if there is some suggestion or incentive to do so.”

None of the references cited by the Examiner to reject the claims discloses or suggests the combinations recited in the claims. Actually, each of the claims as now written recites elements which are not disclosed in any of the prior art references cited against the claims. The references accordingly cannot be combined to reject the claims.

17. Reconsideration and allowance of the application are respectfully requested.

Respectfully submitted,

  
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7002/171/60110 881/646011011 paid 059155

Applicant: **ROKENBOK TOY COMPANY**

Atty/Secy: ERR/cm

Docket No.: ROKEN-40907

Filed: February 11, 1998

Serial No.: 08/797,188

Title: **SYSTEM AND METHOD FOR CONTROLLING THE OPERATION OF**

**TOYS**

Inventor(s): **PETER C. DeANGELIS**

Please acknowledge receipt of the following documents due on December 8, 1998  
sent by First Class Mail on December 7, 1998 by stamping w/PTO stamp and  
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☒ Transmittal Letter (Duplicate/Triplicate)

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☐ Amendment After Final

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Please acknowledge receipt of our Continued Prosecution Application Under 37 C.F.R. § 1.53(d). Copies of the following from parent application Serial No. 08/797,188 filed February 11, 1997: specification (45 pgs); Claims (61 pgs); Declaration and Power of Attorney; (3 pgs); informal/formal drawings (10 pgs); and our check # 062763 in the amount of \$1352.00 to cover the requisite fees herewith by affixing hereon the Patent and Trademark Office stamp (including the serial number and filing date) and returning this card to our office.

Inventor(s): PETER C. DeANGELIS

Serial No. 08/797,188

Title: SYSTEM AND METHOD FOR CONTROLLING THE OPERATION OF TOYS

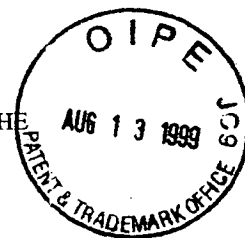
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Attorney Docket No.

ROKEN-40907

First Named Inventor

PETER C. DeANGELIS

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This is a request for a ☒ continuation



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- b. ☐ The inventor(s) to be deleted are set forth on a separate sheet attached hereto.
4. ☐ A new power of attorney or authorization of agent (PTO/SB/81) is enclosed.
5. Information Disclosure Statement (IDS) is enclosed:
- a. ☐ PTO-1449
- b. ☐ Copies of IDS Citations

[Page 1 of 2]

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ROKEN-40907

First Named Inventor

PETER C. DeANGELIS

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Total Pages

This is a request for a ☒ continuation or ☐ divisional application under 37 CFR 1.53(d),  
(continued prosecution application (CPA)) of prior application number 08 / 797,188,  
filed on 2/11/97, entitled SYSTEM AND METHOD FOR CONTROLLING THE OPERATION OF TOYS

### NOTES

**FILING QUALIFICATIONS:** The prior application identified above must be a nonprovisional application that is either: (1) complete as defined by 37 CFR 1.51(b) and filed on or after June 8, 1995, or (2) the national stage of an international application in compliance with 35 U.S.C. 371 and filed on or after June 8, 1995.

**CA-P NOT PERMITTED:** A continuation-in-part application cannot be filed as a CPA under 37 CFR 1.53(d), but must be filed under 37 CFR 1.53(b).

**EXPRESS ABANDONMENT OF PRIOR APPLICATION:** The filing of this CPA is a request to expressly abandon the prior application as of the filing date of the request for a CPA. 37 CFR 1.53(b) must be used to file a continuation, divisional, or continuation-in-part of an application that is not to be abandoned.

**ACCESS TO PRIOR APPLICATION:** The filing of this CPA will be construed to include a waiver of confidentiality by the applicant under 35 U.S.C. 122 to the extent that any member of the public who is entitled under the provisions of 37 CFR 1.14 to access to, copies of, or information concerning, the prior application may be given similar access to, copies of, or similar information concerning, the other application or applications in the file jacket.

**35 U.S.C. 120 STATEMENT:** In a CPA, no reference to the prior application is needed in the first sentence of the specification and none should be submitted. If a sentence referencing the prior application is submitted, it will not be entered. A request for a CPA is the specific reference required by 35 U.S.C. 120 and to every application assigned the application number identified in such request, 37 CFR 1.78(a).

1. ☒ Enter the unentered amendment previously filed on July 26, 1999  
under 37 CFR 1.116 in the prior nonprovisional application.
2. ☒ A preliminary amendment is enclosed.
3. This application is filed by fewer than all the inventors named in the prior application, 37 CFR 1.53 (d)(4).
  - a. ☐ **DELETE** the following inventor(s) named in the prior nonprovisional application:  
.....
  - b. ☐ The inventor(s) to be deleted are set forth on a separate sheet attached hereto.
4. ☐ A new power of attorney or authorization of agent (PTO/SB/81) is enclosed.
5. Information Disclosure Statement (IDS) is enclosed:
  - a. ☐ PTO-1449
  - b. ☐ Copies of IDS Citations

[Page 1 of 2]

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**CLAIMS WORKSHEET**  
**[CPA under (d)]**

**Client I.D./Docket:** ROKEN-40907

**Ser. No.** 08/797,188

**Filing Date:** February 11, 1997

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111, 112, 113, 122, 123, 126, 127, 146, 147, 154, 155, 156,  
157, 159, 160, 161

**No. of Independent Claims:** 21

**No. of Mult. Dep. Claims:** 0

**Total No. of Claims:** 50

**Date Filed:** August 13, 1999

Please acknowledge receipt of our Continued Prosecution Application Under 37 C.F.R. § 1.53(d); Copies of the following from parent application Serial No. 08/797,188 filed February 11, 1997: specification (45 pgs); Claims (61 pgs); Declaration and Power of Attorney; (3 pgs); informal/formal drawings (10 pgs); and our check # \_\_\_\_\_ in the amount of \$1352.00 to cover the requisite fees herewith by affixing hereon the Patent and Trademark Office stamp (including the serial number and filing date) and returning this card to our office.

Inventor(s): PETER C. DeANGELIS  
 Serial No.08/797,188  
 Title: SYSTEM AND METHOD FOR CONTROLLING THE OPERATION OF TOYS  
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CLAIMS	(1) FOR	(2) NUMBER FILED	(3) NUMBER EXTRA	(4) RATE	(5) CALCULATIONS
TOTAL CLAIMS <small>(37 CFR 1.16(c))</small>		50 -20 =	30	x \$ 270 =	\$ 270.00
INDEPENDENT CLAIMS <small>(37 CFR 1.16(b))</small>		21 -3 =	18	x \$ 702 =	702.00
MULTIPLE DEPENDENT CLAIMS (if applicable) <small>(37 CFR 1.16(d))</small>				+ \$ _____ =	
				BASIC FEE <small>(37 CFR 1.16(a))</small>	
Total of above Calculations =					760.00
Reduction by 50% for filing by small entity (Note 37 CFR 1.9, 1.27, 1.28).					380.00
TOTAL =					1352.00

6. Small entity status:
- a. ☐ A small entity statement is enclosed.
  - b. ☒ A small entity statement was filed in the prior nonprovisional application and such status is still proper and desired.
  - c. ☐ Is no longer claimed.
7. The Commissioner is hereby authorized to credit overpayments or charge the following fees to Deposit Account No. 06 - 2425:
- a. ☒ Fees required under 37 CFR 1.16.
  - b. ☐ Fees required under 37 CFR 1.17.
  - c. ☐ Fees required under 37 CFR 1.18.
8. ☒ A check in the amount of \$ 1352.00 is enclosed.
9. ☐ Other: .....

**NOTE:**

*The prior application's correspondence address will carry over to this CPA UNLESS a new correspondence address is provided below.*

**10. NEW CORRESPONDENCE ADDRESS**

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(Insert Customer No. or Attach bar code label here)

or ☒ New correspondence address below

NAME	ELLSWORTH R. ROSTON, ESQ., REG. NO. 16,310				
	FULWIDER PATTON LEE & UTECHT, LLP				
ADDRESS	10877 WILSHIRE BOULEVARD				
	TENTH FLOOR				
CITY	LOS ANGELES	STATE	CALIFORNIA	ZIP CODE	90024
COUNTRY	USA	TELEPHONE	(310) 824-5555	FAX	(310) 824-9696

**11. SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED**

NAME	ELLSWORTH R. ROSTON, ESQ., REG. NO. 16,310
SIGNATURE	<i>Ellsworth R. Roston</i>
DATE	AUGUST 13, 1999

<h2 style="margin: 0;">FEE TRANSMITTAL</h2> <h3 style="margin: 0;">for FY 1999</h3> <p style="font-size: small; margin: 0;">Patent fees are subject to annual revision. Small Entity payments <u>must</u> be supported by a small entity statement, otherwise large entity fees must be paid. See Forms PTO/SB/09-12. See 37 C.F.R. §§ 1.27 and 1.28.</p>		<p><b>Complete if Known</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">Application Number</td> <td>08/797,188</td> </tr> <tr> <td>Filing Date</td> <td>February 11, 1997</td> </tr> <tr> <td>First Named Inventor</td> <td>Peter C. DeAngelis</td> </tr> <tr> <td>Examiner Name</td> <td>D. Muir</td> </tr> <tr> <td>Group / Art Unit</td> <td>3712</td> </tr> <tr> <td>Attorney Docket No.</td> <td>ROKEN-40907</td> </tr> </table>		Application Number	08/797,188	Filing Date	February 11, 1997	First Named Inventor	Peter C. DeAngelis	Examiner Name	D. Muir	Group / Art Unit	3712	Attorney Docket No.	ROKEN-40907
Application Number	08/797,188														
Filing Date	February 11, 1997														
First Named Inventor	Peter C. DeAngelis														
Examiner Name	D. Muir														
Group / Art Unit	3712														
Attorney Docket No.	ROKEN-40907														
TOTAL AMOUNT OF PAYMENT (\$)															

<p><b>METHOD OF PAYMENT (check one)</b></p> <p>1. <input checked="" type="checkbox"/> The Commissioner is hereby authorized to charge indicated fees and credit any over payments to:</p> <p>Deposit Account Number: <b>06-2425</b></p> <p>Deposit Account Name: <b>FULWIDER PATTON, et al.</b></p> <p><input checked="" type="checkbox"/> Charge Any Additional Fee Required Under 37 CFR §§ 1.16 and 1.17</p> <p>2. <input checked="" type="checkbox"/> Payment Enclosed:  <input checked="" type="checkbox"/> Check    <input type="checkbox"/> Money Order    <input type="checkbox"/> Other</p> <p style="text-align: center;"><b>FEE CALCULATION</b></p> <p><b>1. BASIC FILING FEE</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Large Entity Code (\$)</th> <th>Small Entity Code (\$)</th> <th>Fee Description</th> <th>Fee Paid</th> </tr> </thead> <tbody> <tr> <td>101 760</td> <td>201 380</td> <td>Utility filing fee</td> <td>380</td> </tr> <tr> <td>106 310</td> <td>206 155</td> <td>Design filing fee</td> <td></td> </tr> <tr> <td>107 480</td> <td>207 240</td> <td>Plant filing fee</td> <td></td> </tr> <tr> <td>108 760</td> <td>208 380</td> <td>Reissue filing fee</td> <td></td> </tr> <tr> <td>114 150</td> <td>214 75</td> <td>Provisional filing fee</td> <td></td> </tr> <tr> <td colspan="3" style="text-align: right;"><b>SUBTOTAL (1) (\$)</b></td> <td><b>380</b></td> </tr> </tbody> </table> <p><b>2. EXTRA CLAIM FEES</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2">Total Claims</th> <th>Extra Claims</th> <th>Fee from below</th> <th>Fee Paid</th> </tr> </thead> <tbody> <tr> <td>50</td> <td>-20** = 30</td> <td>X</td> <td>270</td> <td>270</td> </tr> <tr> <td>21</td> <td>-3** = 18</td> <td>X</td> <td>702</td> <td>702</td> </tr> <tr> <td colspan="5">Multiple Dependent</td> </tr> </tbody> </table> <p><small>**or number previously paid, if greater; For Reissues, see below</small></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Large Entity Code (\$)</th> <th>Small Entity Code (\$)</th> <th>Fee Description</th> <th>Fee Paid</th> </tr> </thead> <tbody> <tr> <td>103 18</td> <td>203 9</td> <td>Claims in excess of 20</td> <td></td> </tr> <tr> <td>102 78</td> <td>202 39</td> <td>Independent claims in excess of 3</td> <td></td> </tr> <tr> <td>104 260</td> <td>204 130</td> <td>Multiple dependent claim, if not paid</td> <td></td> </tr> <tr> <td>109 78</td> <td>209 39</td> <td>** Reissue independent claims over original patent</td> <td></td> </tr> <tr> <td>110 18</td> <td>210 9</td> <td>** Reissue claims in excess of 20 and over original patent</td> <td></td> </tr> <tr> <td colspan="3" style="text-align: right;"><b>SUBTOTAL (2) (\$)</b></td> <td><b>1352.00</b></td> </tr> </tbody> </table>	Large Entity Code (\$)	Small Entity Code (\$)	Fee Description	Fee Paid	101 760	201 380	Utility filing fee	380	106 310	206 155	Design filing fee		107 480	207 240	Plant filing fee		108 760	208 380	Reissue filing fee		114 150	214 75	Provisional filing fee		<b>SUBTOTAL (1) (\$)</b>			<b>380</b>	Total Claims		Extra Claims	Fee from below	Fee Paid	50	-20** = 30	X	270	270	21	-3** = 18	X	702	702	Multiple Dependent					Large Entity Code (\$)	Small Entity Code (\$)	Fee Description	Fee Paid	103 18	203 9	Claims in excess of 20		102 78	202 39	Independent claims in excess of 3		104 260	204 130	Multiple dependent claim, if not paid		109 78	209 39	** Reissue independent claims over original patent		110 18	210 9	** Reissue claims in excess of 20 and over original patent		<b>SUBTOTAL (2) (\$)</b>			<b>1352.00</b>	<p><b>3. 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<b>SUBMITTED BY</b>		<b>Complete (if applicable)</b>	
Name (Print/Type)	ELLSWORTH R. ROSTON, ESQ.	Registration No. (Attorney/Agent)	16,310
Signature	<i>Ellsworth R. Roston</i>	Telephone	(310) 824-5555
		Date	August 13, 1999

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Description of the Preferred Embodiments

The drawings will now be described in more detail, wherein like referenced numerals refer to like or corresponding elements among the several drawings. Moreover, reference may be made to United States patent applications Ser. No. 08/580,753, Ser. No. 08/763,678 and Ser. No. 08/696,263, which are hereby incorporated in their entirety.

Referring now to Figure 1, one embodiment of a system 10 is generally depicted for controlling the selection and operation of a plurality of toy vehicles. Illustrative examples of toy vehicles constitute a dump truck generally indicated at 12, a fork lift generally indicated at 14, a skip loader generally indicated at 16 and another form of skip loader generally indicated at 17. The toy vehicles such as the dump truck 12, the fork lift 14 and the skip loaders 16 and 17 are simplified versions of commercial units performing function similar to those performed by the toy vehicles 12, 14, 16 and 17. For example, the dump truck 12 may include a working or transport member such as a pivotable bin or container 18; the fork lift 14 may include a working or transport member such as a pivotable platform or grasping arm 20; the skip loader 16 may include a working or transport member such as a pivotable bin or container 22 disposed at the front end of the skip loader; and the skip loader 17 may include a working or transport member such as a pivotable bin or container 23 disposed at the rear end of the skip loader. The working or transport members such as the pivotable bin or container 18, the pivotable platform 20 and the pivotable bins or containers 22 and 23 are constructed to carry storable and/or transportable elements such as blocks 24 or marbles 26 shown schematically in Figure 1.

It will be understood that the toy vehicles 12, 14, 16 and 17 are for illustration purposes only, and a variety of alternative forms are possible. Such alternative forms may be, for example only, and not limited to, various combinations of features. For example, a transport member such as the pivotable bin or container 22, here shown as a scoop 27, such as is disposed at the front end of the skip loader 16 may alternatively be disposed at the front end of a dump truck 25 such that the transport member or scoop 27 may pick up and/or

transport storable and/or transportable elements and/or drop the storable and/or transportable elements into the pivotable bin or container 29 of the dump truck 25.

Each of the toy vehicles 12, 14, 16, 17 and 25 may also have a trailer hitch 19 mounted on the front or rear of the vehicle for hooking a hitch member of another vehicle, such as a trailer (not shown) to the hitch 19 of the vehicles 12, 14, 16, 17 and 25. The trailer hitch 19 may be remotely controlled in similar fashion to the working or transport member of the toy vehicle. Alternatively, the trailer hitch may be mechanically interconnected with the working or transport member such that remote control of the working or transport member also controls the trailer hitch 19.

Each of the dump trucks 12 and 25, the fork lift 14 and the skip loaders 16 and 17 may include a plurality of motors. For example, the dump truck 12 may include a pair of reversible motors 28 and 30 (Figure 4) operable to move the dump truck forwardly, rearwardly, to the right and to the left. The motor 28 controls the movement of the front and rear left wheels and the motor 30 controls the movement of the front and rear right wheels.

When the motors 28 and 30 are simultaneously operated in one direction, the dump truck 12 moves forwardly. The vehicle 12 moves rearwardly when the motors 28 and 30 are moved in the opposite direction. The vehicle 12 turns toward the right when the motor 30 is operated without simultaneous operation of the motor 28. The vehicle 12 turns toward the right when the motor 28 is operated without a simultaneous operation of the motor 30.

The vehicle 12 spins to the right when the motor 30 operates to move the vehicle forwardly at the same time that the motor 28 operates to move the vehicle rearwardly. The vehicle 12 spins to the left when the motors 28, 30 are operated in directions opposite to the operations of the motors in spinning the vehicle to the right.

Another reversible motor 32 in the dump truck 12 operates in one direction to pivot the bin 18 upwardly and in the other direction to pivot the bin downwardly. Alternatively, in the embodiment of the dump truck having a scoop 27 disposed at the front

of the dump truck 25, the reversible motor 32 operates to lift the scoop 27 upwardly and then rearwardly to lift, transport, and then spill the contents of the scoop 27 into the pivotable bin or container 29 of the dump truck 25. Continued rotation of the motor 32 may also operate to then pivot the bin 29 upwardly to spill the contents of the bin 29 out of the rear of the bin 29. In yet another embodiment, continued rotation of the motor 32 may cause the trailer hitch 19 to open. When the motor 32 is operated in the other direction, the trailer hitch 19 closes, the bin 29 pivots downwardly, and the scoop 27 pivots forwardly and downwardly. An additional motor 33 may operate in one direction to turn the bin 29 to the left and in the other direction to turn the bin 29 to the right.

The construction of the motors 28, 30 32 and 33 and the disposition of the motors in the dump trucks 12 and 25 to operate the dump trucks are considered to be well known in the art. The fork lift 14 and the skip loaders 16 and 17 may include motors corresponding to those described above for the dump trucks 12 and 25.

The system 10 may also include stationary plants or accessories. For example, the system 10 may include a pumping station generally indicated at 34 (Figure 1) for pumping elements such as the marbles 26 through a conduit 36. The system may also include a conveyor generally indicated at 38 for moving the elements such as the marbles 26 upwardly on a ramp 40. When the marbles 26 reach the top of the ramp 40, the elements such as the marbles 26 may fall into the bin 18 in the dump truck 12 or into the bin 22 in the skip loader 16. For the purposes of this application, the construction of the pumping station 34 and the conveyor 38 may be considered to be within the purview of a person of ordinary skill in the art.

The system 10 may also include a plurality of hand-held pads generally indicated at 42a, 42b, 42c and 42d (Figure 1). Each of the pads 42a, 42b, 42c and 42d may have substantially identical construction. Each of the pads may include a plurality of actuatable buttons. For example, each of the pads may include a 4-way button 44 in the shape of a cross. Each of the different segments in the button 44 is connected to an individual one of a plurality of switches 46, 48, 50 and 52 in Figure 2.

When the button 44 is depressed at the segment at the top of the button, the switch 46 is closed to obtain the operation of motor 28 and 30 (Figure 4) in moving the selected one of the vehicle 12 forwardly. Similarly, when the segment at the bottom of the button 44 is depressed, the switch 48 is closed to obtain the operation of motors 28 and 30 (Figure 4) in moving the vehicle 12 rearwardly. The selective depression of the right and left segments of the button 44 cause the motors 28 and 30 to operate in turning the selected vehicle toward the right and the left.

It will be appreciated that pairs of segments of the button 44 may be simultaneously depressed. For example, the top and left portions of the button 44 may be simultaneously depressed to obtain a simultaneous movement of the vehicle 12 forwardly and to the left. However, a simultaneous actuation of the top and bottom segments of the button 44 will not have any effect since they represent contradictory commands. This is also true of a simultaneous depression of the left and right segments of the button 44.

Each of the pads 42a, 42b, 42c and 42d may include a button 56 (Figure 1) which is connected to a switch 57 (Figure 2). Successive depressions of the button 56 on one of the pads within a particular period of time cause different ones of the stationary accessories or plants such as the pumping station 34 and the conveyor 38 to be energized. For example, a first depression of the button 56 in one of the pads 42a, 42b, 42c and 42d may cause the pumping station 34 to be energized and a second depression of the button 56 within the particular period of time in such pad may cause the conveyor 38 to be energized. When other stationary accessories are included in the system 10, each may be individually energized by depressing the button 56 a selective number of times within the particular period of time. When the button 56 is depressed twice within the particular period of time, the energizing of the pumping station 34 is released and the conveyor 38 is energized. This energizing of a selective one of the stationary accessories occurs at the end of the particular period of time.

A button 58 is provided in each of the pads 42a, 42b, 42c and 42d to select one of the vehicles 12, 14, 16 and 17. The individual one of the vehicles 12, 14, 16 and 17 selected at any instant by each of the pads 42 a, 42b, 42c and 42d is dependent upon the



number of times that the button is depressed in that pad within a particular period of time. For example, one depression of the button 58 may cause the dump truck 12 to be selected and two sequential selections of the button 58 within the particular period of time may cause the fork lift 14 to be selected.

5           Every time that the button 58 is actuated or depressed within the particular period of time, a switch 59 (in Figure 2) is closed. The particular period of time for depressing the button 58 may have the same duration as, or a different time than, the particular period of time for depressing the button 56. An adder is included in the pad 42 to count the number of depressions of the button 58 within the particular period of time. This  
10       count is converted into a plurality of binary signals indicating the count. The count is provided at the end of the particular period of time. Each individual count provides for a selection of a different one of the vehicles 12, 14, 16, 17 and 25. The count representative of the selection of one of the vehicles 12, 14, 16, 17 and 25 may be maintained in a memory, which may be located either in the pads 42a, 42b, 42c and 42d, or in the central station 64.

15           Buttons 60a and 60b are also included on each of the pads 42a, 42b, 42c and 42d. When depressed, the buttons 60a and 60b respectively close switches 62a and 62b in Figure 2. The closure of the switch 62a is instrumental in producing an operation of the motor 32 in a direction to lift the bin 18 in the dump truck 12 when the dump truck has been selected by the proper number of depressions of the button 58. In like manner, when the  
20       dump truck has been selected by the proper number of depressions of the switch 58, the closure of the switch 62b causes the selective one of the bin 18 in the dump truck 12, the platform 20 in the fork lift 14 and the bin 22 in the skip loader 16 and the bin 23 in the skip loader 17 to move downwardly as a result of the operation of the motor 32 in the reverse direction. Similarly, where the dump 25 includes a scoop 27, actuation of switch 62a operates  
25       motor 32 in a direction to lift the scoop 27 upwardly and then rearwardly, and, where the scoop 27 and the bin 29 are interconnected, causes the bin 29 to pivot upwardly. In like manner, actuation of the switch 62b causes the bin 29 to move downwardly, and the scoop 27 to move forwardly and downwardly as a result of the operation of the motor 32 in the reverse direction.

It will be appreciated that other controls may be included in each of the pads 42a, 42b, 42c and 42d. For example, buttons 61a and 61b may be included in each of the pads 42a, 42b, 42c and 42d to pivot the bin 18 to the right or left when the vehicle 12 has been selected. Such movements facilitate the ability of the bin 18 to scoop elements such as blocks 24 and marbles 26 upwardly from the floor or ground or from any other position and to subsequently deposit such elements on the floor or ground or any other position. It will be appreciated that different combinations of buttons may be actuated simultaneously to produce different combinations of motions. For example, a bin in a selected one of the vehicles may be moved at the same time that the selected one of the vehicles is moved.

Switch 65 is provided in the pads 42a, 42b, 42c and 42d to select the mode of control sharing among the pads 42a, 42b, 42c and 42d. As will be described more fully below, when switch 65 is positioned in a first position to set, for example, pad 42a in a first mode, the toy vehicle that is selected and energized by the pad 42a may be controlled only by actuating the buttons on the pad 42a. No other pad, such as pads 42b, 42c or 42d may control the operation of the vehicle selected by pad 42a. If, however, the operator of pad 42a sets pad 42a in a second mode by switching switch 65 to a second position, the toy vehicle, for example dump truck 12 controlled by pad 42a may also be controlled by any or all of pads 42b, 42c or 42d. In this manner, the operator using pad 42a may grant the operators of any or all of pads 42b, 42c or 42b the ability to control the toy vehicle selected by 42a. The operator of pad 42a, however, may not control any toy vehicle selected by any other of pads 42b, 42c or 42d unless such other one, or all, of those pads is also set in the second mode by positioning the switch 65 of a particular pad in the second position.

Buttons 47 and 49 are also included on each of the pads 42a, 42b, 42c and 42d. When depressed, the button 47 closes switch 53 and button 49 closes switch 51. The functions of switches 51 and 53 will be described more fully below.

A central station generally indicated at 64 in the Figure 1 processes the signals from the individual ones of the pads 42a, 42b, 42c and 42d and sends the processed signals to the vehicles 12, 14, 16, 17 and 25 when the button 58 on an individual one of the pads has

been depressed to indicate that the information from the individual ones of the pads is to be sent to the vehicles. The transmission may be on a wireless basis from an antenna 68 (Figure 1) in the central station to antennas 69 on the vehicles.

5 The transmission may be in packets of signals. This transmission causes the selected ones of the vehicles 12, 14, 16, 17 and 25 to perform individual ones of the functions directed by the depression of the different buttons on the individual ones of the pads. When the commands from the individual ones of the pads 42a, 42b, 42c and 42d are to pass to the stationary accessories 34 and 38 as a result of the depression of the buttons 56 on the individual ones of the pads, the central station processes the commands and sends signals  
10 through cables 70 to the selected ones of the stationary accessories.

Figure 2 shows the construction of the pad 42a in additional detail. It will be appreciated that each of the pads 42b, 42c and 42d may be constructed in a substantially identical manner to that shown in Figure 2. As shown in Figure 2, the pad 42a includes the switches 46, 48, 50 and 52 and the switches 51, 53, 57, 59, 62a, 62b, 63a, 63b and 65. Buses  
15 74 are shown as directing indications from the switches 46, 48, 50, 51, 52, 53, 57, 59, 62a, 62b, 63a, 63b and 65 to a microcontroller generally indicated at 76 in Figure 2. Buses 78 are shown for directing signals from the microcontroller 76 to the switches.

The microcontroller 76 is shown as including a read only memory (ROM) 80 and a random access memory (RAM) 82. Such a microcontroller may be considered to be  
20 standard in the computing industry. However, the programming in the microcontroller and the information stored in the read only memory 80 and the random access memory 82 are individual to this invention.

The read only memory 80 stores permanent information and the random access memory stores volatile (or impermanent) information. For example, the read only memory  
25 80 may store the sequence in which the different switches in the pad 42a provide indications of whether or not they have been closed. The random access memory 82 may receive this sequence from the read only memory 80 and may store indications of whether or not the

switches in the particular sequence have been closed for each individual one of the pads 42a, 42b, 42c and 42d.

The pads 42a, 42b, 42c and 42d are respectively connected to the central station 64 by cables 66a, 66b, 66c and 66d (Figure 1). These cables have, for example, five  
5 conductors or lines encased within an exterior protective sheath. It will be apparent that the structure of cables 66a, 66b, 66c and 66d, and the functions of that structure, are identical for each of the cables 66a, 66b, 66c and 66d. Thus, only the cable 66a, and its operation in conjunction with pad 42a and the central station 64, will be described.

The central station provides a clock signal, SCLK to the pad 42a over line 86  
10 of cable 66a. A second line, line 84, in cable 66a, carries interrogation signals from the central station 64 to the pad 42a. The pad 42a transmits signals over line 88 (SDATA) of cable 66a to the central station 64 in response to a combination of the interrogation signal transmitted by the central station 64 to the pad 42a over line 84 and the clock signal  
15 transmitted to the pad 42a by the central station 64 over line 86. Thus, only three lines in each one of cables 66a, 66b, 66c and 66c are used for interrogation of the pad 42a and communication of data by the pad 42a to the central station 64. A more detailed description of the interrogation and data transmission process will be provided below.

A fourth line in cable 66a provides electrical power to the pad 42a from the  
20 central station 64. A fifth line in cable 66a serves as a common ground connection between the pad 42a and the central station 64.

The pad 42a in Figure 2 receives the interrogating signals from the central  
station 64 through line 84. These interrogating signals are not synchronized by clock signals on line 86. Each of the interrogating signals intended for the pad 42a may be identified by  
25 an address individual to such pad. When the pad 42a receives such interrogating signals, it sends to the central station 64 through line 88 a sequence of signals indicating the status of the successive ones of the switches 46 48, 50 and 52 and the switches 51, 53, 57, 59 62a, 62b, 63a, 63b and 65. These signals are synchronized by the clock signals on the line 86.

It will be appreciated that the status of each of the switches 57 and 59 probably is the first to be provided in the sequence since these signals indicate the selection of the stationary accessories 34 and 38 and the selection of the vehicles 12, 14, 16, 17 and 25.

5 The pads 42a, 42b, 42c and 42d include an array of a plurality of light emitting diodes (LED) generally indicated at 93. These light emitting diodes 93 provide a visual indication of which one of the vehicles 12, 14, 16, 17 and 25 has been selected by the operator of a particular pad. The pads 42a, 42b, 42c and 42d may be connected to the central station 64 by plugging the end of the respective one of cables 66a, 66b, 66c and 66d into one of the ports on the central station 64 provided for that purpose. When the power is provided  
10 to the central station 64 and the system 10 is turned on, the start up state of the system 10 is such that none of the vehicles 12, 14, 16, 17 and 25 is selected by any of the pads 42a, 42b, 42c and 42d. Accordingly, the array of light emitting diodes 93 on each of the pads 42a, 42b, 42c and 42d may provide an indication on each pad that no vehicle has been selected by the operator of that pad. Such an indication may be, for example, providing a signal to the first  
15 individual light emitting diode 93 in the array for a predetermined period of time to light the light emitting diode 93, removing the signal, causing the lighted light emitting diode to be extinguished, and then providing the signal to the next individual light emitting diode 93 in the array. This process is continued, lighting each of the individual light emitting diodes 93 in turn until all of the light emitting diodes have been illuminated or until button 58 has been  
20 depressed, actuating switch 59 to select one of the vehicles 12, 14, 16, 17 and 25. If all of the light emitting diodes 93 in the array have been illuminated, and the button 58 has not been depressed by the operator, the first light emitting diode 93 in the array will again be illuminated, followed by the second light emitting diode, and so on as described above.

25 It may also happen that the system 10 is in use by one or more operators at the time an additional operator desires to also use the system, but not all of the pads 42a, 42b, 42c and 42d are connected to the central station 64. Thus, one of the pads 42a, 42b, 42c and 42d may need to be connected to the central station while the system 10 is in use to accommodate the additional operator. One advantage of the present invention is that an additional one or more of the pads 42a, 42b, 42c and 42d may be connected to the central

station 64 while the system 10 is in use without powering down the system 10. The central station 64 is capable of detecting the additional one or more of the pads 42a, 42b, 42c and 42d when it is connected to the central station 64, initialize the newly connected one or more of the pads 42a, 42b, 42c and 42d, and cause the light emitting diodes 93 of the newly  
5 connected pad to indicate that none of the vehicles 12, 14, 16, 17 and 25 have been selected by the newly connected pad.

Alternatively, an operator may disconnect one of the pads 42a, 42b, 42c and 42d from the central station 64 while the system 10 is in use and others of the pads 42a, 42b, 42c and 42d are being used. When the pad is disconnected, the central station 64  
10 automatically detects that the pad is disconnected and transmits a signal to the vehicle selected by the disconnected pad causing the vehicle to indicate that it is now available for selection by another one of the pads 42a, 42b, 42c and 42d that remain connected to the central station 64. When a vehicle is being controlled by more than one pad, such as when one of the pads controlling the vehicle is in the second mode as described previously, disconnection of one  
15 of the pads will not affect the control of the vehicle by the remaining, connected pad.

As previously indicated, the pad 42a selects one of the vehicles 12, 14, 16, 17 and 25 in accordance with the number of closings of the switch 59. As the user of the pad 42a provides successive actuations or depressions of the button 58, signals are introduced to a shift register 90 through a line 92 to indicate which one of the vehicles 12, 14, 16, 17 and  
20 25 would be selected if there were no further depressions of the button. Each one of the depressions of the button 58 causes the indication to be shifted to the right in the shift register 90. Such an indication is provided on an individual one of the plurality of light emitting diodes (LED) 93. The shifting of the indication in the shift register 90 may be synchronized with a clock signal on a line 95. Thus, the illuminated one of the light emitting diodes 93  
25 at each instant indicates at that instant the individual one of the vehicles 12, 14, 16, 17 and 25 that the pad 42a has selected at such instant.

The central station 64 is shown in additional detail in Figure 3. It includes a microcontroller generally indicated at 94 having a read only memory (ROM) 96 and a random

access memory (RAM) 98. As with the memories in the microcontroller 76 in the pad 42a, the read only memory 96 stores permanent information and the random access memory 98 stores volatile (or impermanent) information. For example, the read only memory 96 sequentially selects successive ones of the pads 42a, 42b, 42c and 42d to be interrogated on a cyclic basis. The read only memory 96 also stores a plurality of addresses each individual to a different one of the vehicles 12, 14, 16, 17 and 25.

Since the read only memory 96 knows which one of the pads 42a, 42b, 42c and 42d is being interrogated at each instant, it knows the individual one of the pads responding at that instant to such interrogation. The read only memory 96 can provide this information to the microcontroller 94 when the microcontroller provides for the transmittal of information to the vehicles 12, 14, 16, 17 and 25. Alternatively, the microcontroller 76 in the pad 42a can provide an address indicating the pad 42a when the microcontroller sends the binary signals relating to the status of the switches 46, 48, 50 and 52 and the switches 51, 53, 57, 59, 62a, 62b, 63a, 63b and 65 to the central station 64.

As an example of the information stored in the random access memory 98 in Figure 3, the memory stores information relating to each pairing between an individual one of the pads 42a, 42b, 42c and 42d and a selective one of the vehicles 12, 14, 16, 17 and 25 in Figure 1 and between each individual one of such pads and a selective one of the stationary accessories 34 and 38. The random access memory 98 also stores the status of the operation of the switches 46, 48, 50 and 52 for each pad and the operation of the switches 51, 53, 57, 59, 62a, 62b, 63a, 63b and 65 for each pad.

When the central station 64 receives from the pad 42a the signals indicating the closure (or the lack of closure) of the switches 46, 48, 50 and 52 and the switches 51, 53, 57, 59, 62a, 62b, 63a, 63b and 65, the central station retrieves from the read only memory 96 the address of the individual one of the vehicles indicated by the closures of the switch 59 in the pad. The central station may also retrieve the address of the pad 42a from the read only memory 96.

The central station 64 then formulates in binary form a composite address identifying the pad 42a and the selected one of the vehicles 12, 14, 16, 17 and 25 and stores this composite address in the random access memory 98. The central station 64 then provides a packet or sequence of signals in binary form including the composite address and including  
5 the status of the opening and closing of each of the switches in the pad 42a. This packet or sequence indicates in binary form the status of the closure of each of the switches 46, 48, 50 and 52 and the switches 51, 53, 57, 59, 62a, 62b, 63a, 63b and 65.

Each packet of information including the composite addresses and the switch closure information for the pad 42a is introduced through a line 102 (Figure 3) to a radio  
10 frequency transmitter 104 in the central station 64. The radio frequency transmitter 104 is enabled by a signal passing through a line 106 from the microcontroller 94.

When the radio frequency transmitter 104 receives the enabling signal on the line 106 and the address and data signals on the line 102, the antenna 68 (also shown in Figure 1) transmits signals to all of the vehicles 12, 14, 16, 17 and 25. The signals are  
15 transmitted to the vehicles 12, 14, 16, 17 and 25 at the same frequency. In a preferred embodiment, the microcontroller 94 provides enabling signals to the radio frequency transmitter 104 causing the radio frequency transmitter 104 to transmit a continuous stream of packets 200 through the antenna 68 at all times that the central station 64 is powered up, including when none of the pads 42a, 42b, 42c and 42d has selected any of the vehicles 12,  
20 14, 16, 17 and 25. However, the individual one of the vehicles 12, 14, 16, 17 and 25 will only respond to packets of signals from the central station 64 having the address associated with that vehicle.

Referring now to Fig. 5, a typical packet or sequence 200 is described. As will described more fully below, the packet 200 is a sequence of signals in binary form that are  
25 transmitted by the central station 64 using radio frequencies to receivers included in each of the vehicles 12, 14, 16, 17 and 25. Each packet 200 of signals transmitted by the central station 64 includes a pair of start bits or signals 202, 204. These start bits 202, 204 are a signal that the following 16 bits of information contain commands in binary form



representative of the status of the closure of each of the switches 46, 48, 50 and 52 and the switches 51, 53, 59, 62a, 62b, 63a, and 63b. Each packet 200 is thus defined by the start bits 202, 204, and includes all of the bits beginning with the first start bit 202 and terminating with the sixteenth and last data bit. The packet thus contains a total of eighteen bits. The packets are transmitted continuously by the radio frequency transmitter 104 while the central station is turned on. The first start bit 202 is transmitted immediately after the transmission of the sixteenth data bit. There is no time interval between the end of one packet and the beginning of the next packet transmitted.

One possible sequencing of the binary signals comprising the packet 200 is depicted in Fig. 5. The first four bits of binary information following the start bits 202 and 204, bits 206, 208, 210 and 212, form a composite address identifying the selected one of the vehicles 12, 14, 16, 17 and 25. The four bits of binary information may be either a binary 1 or a binary 0. Thus, in the embodiment of the invention using four bits 206, 208, 210 and 212 to compose unique vehicle addresses, sixteen unique combinations of binary information that may be used to identify as many as sixteen individual vehicles are possible.

Following the identification bits 206, 208, 210 and 212 are 11 bits of binary information that reflect the status of switch closures on the pad 42a. For example, when switch 46 is closed by an operator depressing button 44 to control the selected one of the vehicles 12, 14, 16, 17 and 25 to move forward, bit 214 will be a binary 1. If the operator has released button 44, or depressed button 44 in such a manner that switch 46 is no longer closed, bit 214 will be a binary 0. Similarly, actuating button 44 to close switch 48 results in bit 216 to be a binary 1; actuating switch 50 causes bit 218 to be a binary 1; actuating switch 52 causes bit 220 to be a binary 1. Actuating button 60a to lift a bin, for example bin 18, closes switch 62a and causes the value of bit 222 to be a binary 1. Similarly, actuating button 60b to lower bin 18 closes switch 62b and causes the value of bit 224 to be a binary 1. Actuating button 61a to pivot bin 8 to the right, or close the grip of the fork lift 14 closes switch 63a and causes the value of bit 226 to be a binary 1. Actuating button 61b to pivot bin 18 to the left, or to open the grip of the fork lift 14 closes switch 63b and causes the value of bit 228 to be a binary 1.

One unique capability of the system of the present invention is the incorporation of a shift button 49. When the "shift" button 49 is depressed, actuating switch 51, in conjunction with the simultaneous depression of one of buttons 60a, 60b, 61a and 61b, the microcontroller 94 may interpret the simultaneous depressions of shift button 49 and one of the other buttons as a shifted command, and cause the value of bit 230 to be a binary 1. Similarly, simultaneous depression of button 47, closing switch 53, and any one of buttons 60a, 60b, 61a and 61b will be interpreted by the microcontroller 94 of the central station 64 as a second shifted command. The microcontroller will then set the value of bit 232 to a binary 1.

The final bit of the packet 200 is bit 236. Unlike the other data bits in the packet 200, bit 236 is reserved for use by an accessory connected to the smart port 115. This bit may be set by the microcontroller in an accessory connected to the smart port 115 to control the microcontroller 94 of the central station 64 to cause an action to take place, such as energizing a sound board to simulate, for example, the firing of a gun or the sounding of a train whistle or a truck horn. As will be more fully described below, various accessories or another central station 64b may be connected to the central station 64 through the smart port or adaptor 115. These accessories or additional central station may alter the processing of the signals received from the pad 42a by the microcontroller 94 of the central station 64, such that the binary values of the bits of the packet 200 may be representative of commands to carry out different functions for the buttons of the pad 42a than have been described previously.

In its simplest embodiment, the packet 200 comprises a pair of start bits 202, 204 followed by sixteen data bits, each data bit having a value of binary 0, that are repeatedly transmitted by the radio frequency transmitter at a predetermined frequency or rate. The interval of time between successive pairs of start bits 202, 204 also determines the duration of the sixteen data bits within the packet. Thus, the bit duration of each of the sixteen data bits following the start bits 202, 204 is a value equal to the interval of time between pairs of start bits 202, 204 in the stream of packets 200 divided by sixteen, the number of data bits in each packet 200.

Because the output of the radio frequency transmitter 104 is RF energy, it is necessary to encode the packet of energy comprising an individual packet 200 accordingly to represent the binary values of each of the individual ones of the bits comprising the packet 200. In one encoding scheme, a binary 0 may be represented by a transition from low to high at a particular time within the bit duration. This is illustrated at 401 in Figure 6. A binary 1 may be represented by causing the transition from high to low to take place at a different time within the bit duration. This is illustrated at 403 in Figure 6. Similarly, the start bits 202, 204 may a transition from high to low that occurs at a specific time within the bit duration that is different from any other bit that may be transmitted by the radio frequency transmitter 104 of the central station 64. Thus, the transmitter 104 may form packets 200 by simply transmitting a repetitive series of high to low transitions, substituting a pair of start bits 202, 204 for the high to low transitions at a frequency equal to the packet duration.

The microcontroller 94 stores in the random access memory 98 the individual ones of the vehicles such as the vehicles 12, 14, 16, 17 and 25 being energized at each instant by the individual ones of the pads 42a, 42b, 42c and 42d. Because of this, the central station 64 is able to prevent the interrogated one of the pads 42a, 42b, 42c and 42d from selecting one of the energized vehicles when the pad 42 that had previously selected the energized vehicle has been placed in the first mode by the operator by placing switch 65 in the first position. Thus, for example, if the vehicle 14 is being energized by one of the pads 42a, 42b, 42c and 42d at a particular instant, a first depression of the button 58 in the pad being interrogated at that instant will cause the vehicle 12 to be initially selected and a second depression of the button by such pad will cause the vehicle 14 to be skipped and the vehicle 16 to be selected. If, however, the operator of the pad 42 energizing a particular vehicle at a particular instant has been placed in the second mode by placing the switch 65 in the second position, a first depression of the button 58 in another pad being interrogated at that instant will cause the vehicle 12 to be initially selected, and the second depression of the button by such pad will not skip vehicle 14, but will allow the pad to control vehicle 14 in concert with the pad that first energized vehicle 14.

Furthermore, in the example above where the pad 42a has previously selected the vehicle 14, the microcontroller 94 in the central station 64 will cause the vehicle 14 to be released when the pad 42a selects any of the vehicles 12, 16, 17 and 25. Thus, while a single vehicle may be controlled by more than one of pads 42a, 42b, 42c and 42d at a particular instant, each one of pads 42a, 42b, 42c and 42d may only control one of the vehicles 12, 14, 16, 17 and 25 at a single instant. When the vehicle 14 becomes released, it becomes available immediately thereafter to be selected by any one of the pads 42a, 42b, 42c and 42d. The release of the vehicle 14 by the pad 42a and the coupling between the pad 42a and a selected one of the vehicles 12, 14, 16, 17 and 25 are recorded in the random access memory 98 in the microcontroller 94.

It is advantageous to optimize the packets transmitted by the central station 64 so that each transmitted packet contains sufficient information to provide control of the vehicles and accessories in a pleasing manner, but not so much information that troublesome lag times adversely affecting the smooth control of the vehicles are introduced. To prevent such troublesome lag times, the central station 64 uses a variety of methods to prioritize interrogation of the pads 42a, 42b, 42c and 42d, data processing and transmission of the data in packets to the vehicles 12, 14, 16 17 and 25.

In one approach, the microcontroller 94 provides packets of data for transmission to each vehicle in operation in a sequential, round-robin, fashion. In this approach, four packets of commands, each packet being associated with the binary address of each of the vehicles being controlled by individual pads 42a, 42b, 42c and 42d, are transmitted one after another until all four packets are transmitted. Thus the packet of commands addressed to a vehicle controlled by pad 42a may be transmitted first, followed by a packet of commands intended for the vehicle controlled by pad 42b, followed by a packet of commands intended for the vehicle controlled by pad 42c and followed by a packet of commands intended for the vehicle controlled by pad 42d. The sequence of packets would then be repeated. It is evident that this is just one possible sequencing of packets that may be transmitted; other sequences of packet transmission are possible, depending on the program commands stored in the read only memory 96 of the microcontroller 94.

This round-robin transmission method may require, for example, 48 milliseconds to transmit for all four packets. In the case where eight vehicles are being controlled, a transmission cycle would require, for example, 96 milliseconds, or almost 1/10th of a second for all eight packets of command data to be transmitted. Even if the vehicles are traveling at the minimum speed the motors are capable of, the first vehicle may travel perhaps several inches between transmission of packets of commands by the central station 64.

Another embodiment of the invention transmits packets of data only for vehicles that have been selected by users by pressing button 58 the required number of times within the predetermined time. In this manner, only data for vehicles actually under control of a user is transmitted.

In a preferred embodiment, the random access memory 98 maintains a record of the state of each of the pads 42a, 42b, 42c and 42d and the time since the state of the pads changed. One skilled in the art will understand that the actuation of any of the buttons 44, 47, 49 56, 58 60a, 60b, 61a, 61b or 65 of the pad 42a results in a change in the state of the pad 42a. If none of the buttons of the pad 42a is actuated by the operator during the time between interrogations of the pad 42a by the central processor 64, then the state of the pad 42a will not have changed.

Since the state of each of the pads 42a, 42b, 42c and 42d is maintained in the random access memory 98 of the central station 64, the microcontroller 94 may further process the signals received from each of the pads 42a, 42b, 42c and 42d to determine if the state of the pad has changed even if an operator has actuated one of the buttons on the pad. For example, if an operator presses button 44 to command the vehicle energized by that pad to move forward, additional actuations of the button 44 without actuating any other of the buttons of the pad will not result in a change in the state of the pad, and a packet of commands need not be transmitted by the microcontroller 94.

As described previously, the microcontroller 94 of the central station 64 may transmit a continuous stream of packets of commands in a sequential, round-robin, fashion

to the vehicles controlled by the pads 42a, 42b, 42c and 42d. The microcontroller continues to transmit this sequential stream of packets even when none of the buttons on pads 42a, 42b, 42c and 42d have been actuated.

When, however, the microcontroller 94 of the central station 64 determines that  
5 the state of one of the pads 42a, 42b, 42c and 42d has changed, it responds by forming a packet of commands representative of the state of the pad and inserting the newly formed packet of commands into the stream of packets being continuously transmitted, even if the newly formed packet is inserted at a position in the sequence of packets different from the position a packet associated with that particular pad would normally have in the round-robin  
10 sequence of packets. If buttons on two or more of the pads 42a, 42b, 42c and 42d are actuated simultaneously, the microcontroller 94 may form packets of commands representative of the state of those pads and insert the packets in the stream of packets. In this case, the microcontroller 94 may insert the newly formed packets in the order in which they would have been sent in the round-robin sequence, except that the string of newly formed packets  
15 may be inserted in the continuous round-robin sequence out of order. For example, buttons on pads 42a and 42c may be actuated simultaneously and the microcontroller may form a string of packets representative of the state of the pads 42a and 42c such that the packet associated with pad 42a is transmitted before the packet associated with pad 42c. The microcontroller 94 may then insert this string of packets in the stream of packets at the next  
20 available instance, for example, after a packet associated with pad 42c but which is not representative of the change of state of pad 42c has been transmitted. In this manner, the microcontroller 94 employs an intelligent funneling of the data provided by each of the pads 42a, 42b, 42c and 42d during the interrogation process to form packets of commands to be transmitted to each of the vehicles energized by the pads 42a, 42b, 42c and 42d.

25 The vehicles 12, 14, 16 and 17 are battery powered. As a result, the energy in the batteries in the vehicles 12, 14, 16 and 17 tends to become depleted as the batteries provide the energy for operating the vehicles. The batteries in the vehicles 12 and 14 are respectively indicated at 108 and 110 in Figure 3. The batteries 108 and 110 are chargeable by the central station 64 because the central station may receive AC power from a wall

socket. The batteries are charged only for a particular period of time. This particular period of time is preset in the read only memory 96. When each battery is being charged for the particular period of theme, a light 109 in a circuit with the battery becomes illuminated. The charging current to each of the batteries 108 and 110 may be limited by a resistor 111. The light 109 becomes extinguished when the battery has been charged.

The central station 64 of the present invention, as mentioned previously, includes a microcontroller 94, random access memory 98 and read only memory 96. The central station 64 also includes a smart port 115 that is connected to the microcontroller 94 by lines 505, 510, 520, 530 and 540. The signals transmitted and received by the microcontroller 94 over the SDATA0, SDATA1, SDATA2 and the SDATA3 lines to the pads 42a, 42b, 42c and 42d may be provided to an accessory connected to the smart port 115 over a cable 114. Using this configuration, all of the signals from the pads 42a, 42b, 42c and 42d may be rerouted through the smart port 115 before being processed by the microcontroller 94. One principal advantage of this configuration of the central station 64 is that various accessories, including additional central stations, may be connected to the smart port 115 and alter signals received from the pads 42a, 42b, 42c and 42d and process the signals in a different manner than they would normally be processed by the microcontroller 94. Accessories that may be attached to the smart port 115 may include additional microcontrollers 94a that may, for example, have information stored in a separate read only memory and random access memory that allow the second processor to remap the functions of the buttons 44, 47, 49, 56, 58, 60a, 60b, 61a, 61b and 65 on the pads 42a, 42b, 42c and 42d. For example, a signal from pad 42a representative of the closure of switch 46 could be routed through the smart port 115 and over the cable 114 to be processed by the accessory microcontroller 94a. All signals rerouted to accessories connected to the smart port 115 are returned after processing by the accessory over the cable 114 to the microcontroller 94. The microcontroller 94 then forms a packet 200 comprising data bits commanding the appropriate receiver to take action. For example, a signal from a pad may be interpreted by microcontroller 94a as a command to a toy hockey player to raise its arm, rather than the usual meaning for the command, such as to command a toy vehicle to move forward. The microcontroller 94a would then provide a signal over cable 114 to the microcontroller 94. In

this manner, each of the keys of the pads 42a, 42b, 42c and 42d may be reprogrammed to have different functions. This approach is particularly advantageous in that it allows for increased flexibility and future expansion of the capabilities of the central station. Thus, the central station could control a wide variety of games and activities without the need for costly changes in hardware or reprogramming the information stored in the read only memory 96.

A particularly illustrative example of the advantages of the smart port 115 is where an additional central station 64 is connected to the first central station 64. Each central station 64 may have the capabilities of servicing only a limited number of pads. For example, each central station 64 may have the capabilities of servicing only the four (4) pads 42a, 42b, 42c and 42d. It may sometimes happen that the users of the system may wish to be able to service more than four (4) pads. Under such circumstances, the microcontroller 94 in the central station 64 and a microcontroller, generally indicated at 94a, in the second central station corresponding to the central station 64 may be connected by cable 114 to the smart port 115.

One end of the cable 114 may be constructed so as to connect to a ground 117 in the smart port 115. This ground operates upon the central station to which it is connected so that such central station is a slave to, or subservient to, the other central station. For example, the ground 117 in the smart port 115 may be connected to the microcomputer 94a so that the central station including the microcontroller 94a is a slave to the central station 64. When this occurs, the microcontroller 94 in the central station 64 serves as the master for processing the information relating to the four (4) pads and the four (4) vehicles in its system and the four (4) pads and the four (4) vehicles in the other system. The expanded system including the microcontrollers 94 and 94a may be adapted so that the address and data signals generated in the microcontroller 94a may be transmitted by the antenna 68 in the central station 64 when the central station 64 serves as the master station. The operation of the central station 64a may be clocked by the signals extending through a line 118 from the central station 64 to the adaptor 115 and through a corresponding line from the other central station to the adaptor.



Referring now to Figure 10, the interface of the smart port 115 will be described in more detail. As described above, an accessory generally indicated at numeral 500 may be connected to the smart port 115 of the central station 64. The accessory 500 may include a microcontroller 502. The microcontroller 502 of the accessory 500 may also include  
5 a random access memory 544 and a read only memory 546. As with the memories in the microcontroller 94 in the central station 64, the random access memory 544 stores volatile or impermanent information and the read only memory 96 stores permanent information.

As shown in Figure 3, the microcontroller 94 of the central station is connected to the smart port 115 using five signal lines, lines SK line 505, SO line 510, SI line 520,  
10 ACCIO line 530 and ACCIO2 line 540 and a ground line 117. The ground line 117 provides a common electrical reference for the microcontroller 94 of the central station 64 and the microcontroller 502 of the accessory 500. These lines are similarly shown in Figure 10, but the lines are shown directly connected to the accessory 500, with the smart port 115 indicated in dashed form. It will be apparent that the smart port 115 may be only a connector mounted  
15 on the central station 64 allowing the connection of the cable 114 (Figure 3). The cable 114 has one end connected to the accessory 500, either directly or through an appropriate connector, and the other end terminating in a connector compatible with a corresponding connector forming the smart port 115 of the central station 64.

In a preferred embodiment, each of the microcontrollers 94 and 502 include  
20 a serial interface comprising inputs and outputs for connecting the lines 505, 510, 520, 530 and 540 and various logical elements, such as shift register 97 in the microcontroller 94 of the central station 64 and shift register 542 in the microcontroller 542 of the accessory 500. These serial interfaces enable the transfer of data between the microcontroller 94 of the central station 64 and the microcontroller 502 of the accessory 500. As used in the present  
25 invention, the serial interface of the microcontroller 94 of the central station 64 is configured as a master and provides a shift clock signal over the SK line 505 to the SK input of the microcontroller 502 in the accessory 500. Thus, the transfer of data over the serial interface to the microcontroller 502 is controlled by the microcontroller 94 of the central station.

In the present invention, as depicted in Figure 10, the SO output of the smart port 115 is connected to the SI input of the microcontroller 502 by line 520. Similarly, the SO output from the microcontroller 502 of the accessory 500 is connected to the SI input of the microcontroller 94 of the central station 64 by line 510. In this manner, data may be shifted out of the shift register 97 of the microcontroller 94 of the central station 64 over the SO line 520 into the SI input of the microcontroller 502 into the shift register 542 of the accessory 500. Similarly, since the data transfer over the serial interface is bidirectional, as will be more fully described below, data may be shifted out of the shift register 542 of the microcontroller 502 over the SI line 510 into the SI input of the microcontroller 94 and into the shift register 97 of the central station 64. Two additional lines, lines ACCIO line 530 and ACCIO2 line 540 carry handshaking signals output by the microcontrollers 502 and 94 respectively, the ACCIO2 line 540 carrying signals from the microcontroller 94 to the microcontroller 502, and the ACCIO line 530 carrying signals from the microcontroller 502 to the microcontroller 94.

Referring now to Figures 10 and 11, a typical timing sequence of data flow across the serial interface of the smart port 115 will be described. The microcontroller 94 in the central station 64 continuously provides the smart port 115 with signals representing the current state of the central station 64. Such signals may be, for example, signals indicating the status of switch closures in the pads 42a, 42b, 42c, and 42d, signals representative of the values of various timing function carried out by the microcontroller 94 of the central station 64, such as signals indicating how much time remains before a vehicle will be provided with a signal to enter the powered, but inactive state because there has been no thumb pad activity, or signals indicating that a vehicle will be released from a particular one of the pads 42a, 42b, 42c and 42d because no switch on the particular pad had been activated for a prolonged period of time.

The microcontroller 94 monitors the state of the signal on line ACCIO 530. When the signal on line 530 is high, which may be the normal state of the signal on the line 530, the central station 64 assumes that either no accessory is connected to the smart port 115, or that the accessory 500 is a "dumb" accessory which is incapable of modifying the signals

provided by the microcontroller 64 through the smart port 115. Examples of such "dumb" accessories may include devices that react to the signals provided by the central station, but do not process the signals, such as a sound device that produces a sound in response to a signal from the central station. When a "dumb" accessory, or no accessory at all, is connected to the smart port 115, the microcontroller 94 of the central station continues to process data, for example, data received from the pads 42a, 42b, 42c and 42d, in a normal mode, acting upon the data stored in the random access memory 98 and causing signals to be sent to the receivers of the various vehicles through the radio frequency transmitter 104 (Figure 3).

The accessory may also be a so called "smart" accessory possessing the ability to process and modify the signals received from the smart port 115, and then return the modified signals to the microcontroller 94 of the central station 64 through the smart port 115. When a "smart" accessory is connected to the smart port 115, the microcontroller 94 of the central station enters a second operating mode. In this operating mode, the microcontroller is configured to receive modified data from the microcontroller 502 of the accessory 500 and store that modified data in its random access memory 98. Depending on the programmable capabilities of the microcontroller 502 of the accessory 500, all, or a selected portion, of the data stored in the random access memory 98 of the microcontroller 94 may be modified by the microcontroller 502 of the accessory 500. Additionally, when a "smart" accessory is connected to the smart port 115, the microcontroller 94 of the central station may not process any of the signals received from the pads 42a, 42b, 42c and 42d, but instead provide the signals unchanged to the smart port 115 for transmission to the microcontroller 502 of the accessory 500.

The microcontroller 94 of the central station 64 detects when a smart accessory 500 is attached to the smart port 115 because the signal on line ACCIO 530 will be periodically driven low by the microcontroller 502 of the accessory 500, indicating that the accessory is ready to receive data from the microcontroller 94 of the central station 64. Once the signal on line 520 goes low, the microcontroller 94 will begin sending data to the microcontroller 502 through the smart port 115 over the SO line 520 when the microcontroller determines it has data to send to the accessory. It will be apparent that since the

microcontroller 94 of the central station 64 is the master, as described above, it is the microcontroller 94 that controls the flow of data over the serial interface to the accessory 500. The microcontroller 502 of the accessory 500 may only be enabled to indicate that it is ready to receive data from the microcontroller 94 by driving the line ACCIO line low. Thus, if the  
5 microcontroller 94 has no data to send to the microcontroller 502 because, for example, no buttons on the pads 42a, 42b, 42c and 42d have been pushed, the microcontroller 502 simply waits for data to be sent.

As indicated by the timing diagram line 550 of Figure 12, the transition of the signal level on ACCIO line 530 from high to low causes the shift register 97 of the  
10 microcontroller 94 of the central station 64 to begin shifting data bits (assuming there is data to send) out of the shift register 97 onto the SO line 520. Because the SO line 520 is connected to the shift input of the shift register 542 of the microcontroller 502 of the accessory 500, each bit shifted from the microcontroller 94 is shifted into the shift register 542 of the microcontroller 502. Because the shift registers 97 and 542 are serial input/output  
15 registers, shifting a bit of data out of the shift register 97 into the shift register 542 over the SO line 520 causes a bit to be shifted out of the shift register 542 of the microcontroller 502 onto line 530 and into the shift input of the shift register 97 of the microcontroller 94 of the central station 64.

The microcontroller 94 generates a shift clock signal, indicated as line 552 in  
20 Figure 11. Bits are shifted out of, and thus into, the shift registers 97 and 542 in response to the transition of the shift clock signal from high to low on the SK line 505. The microcontroller 94 may be programmed to maintain a count of the number of shift clock signals provided since the first shift clock signal. When the count equals, for example, eight, indicating that eight shift clock signals have been provided to shift a total of eight bits out of  
25 the shift registers 97 and 542, the microcontroller 94 may pulse the signal on the ACCIO2 line 540 low for a brief period of time, indicating to the microcontroller 502 of the accessory 500 that the microcontroller 94 has completed sending eight bits of data over the SO line 520. When the signal on line ACCIO2 goes low, the microcontroller 502 resets the signal on the ACCIO line 540 to high, indicating to the microcontroller 94 of the central station that the

microcontroller 502 is processing the data sent to it over the SO line 520 by the microcontroller 94 and is not ready at that instant to receive any additional data.

When the microcontroller 502 is again ready to receive data from the microcontroller 94, such as, for example, when microcontroller 502 has completed processing the data received from the microcontroller 94 during the previous shift cycle, the microcontroller 502 drives the signal on line ACCIO 530 low, indicating its state of readiness to the microcontroller 94 of the central station 64. At this time, if the microcontroller 94 of the central station has data to send to the microcontroller 502 of the accessory 500, the shift cycle is repeated. One advantage of this interface is that data flows to and from the microcontroller 94 of the central station 64 and to and from the microcontroller 502 of the accessory 500 simultaneously. This feature is particularly important since the routing of the signals from the central station 64 to the accessory 500, and subsequent processing of those signals by the microcontroller 502 and retransmission back to the central station 64 requires additional time, and thus may impart unacceptable delay in the response of the vehicles 12, 14, 16, 17 and 25 to actuations of buttons on the pads 42a, 42b, 42c and 42d.

The vehicle 12 is shown in additional detail in Figure 4. Substantially identical arrangements may be provided for the vehicles 14, 16, 17 and 25. The vehicle 12 includes the antenna 69 for receiving from the central station 64 signals with the address of the vehicle and also includes a receiver 121 for processing the received signals. The vehicle 12 also includes the motors 28, 30, 32 and 33. Each of the motors 28, 30, 32, and 33 receives signals from an individual one of the transistor drivers 120 connected to a microcontroller generally indicated at 122.

The microcontroller 122 includes a read only memory (ROM) 124 and a random access memory (RAM) 126. As with the memories in the pad 42a and the central station 64, the read only memory 124 may store permanent information and the random access memory 126 may store volatile (or impermanent) information. For example, the read only memory 124 may store information indicating the sequence of the successive bits of information in each packet for controlling the operation of the motors 28, 30, 32 and 33 in

the vehicle 12. The random access memory 126 stores information indicating whether there is a binary 1 or a binary 0 at each successive bit in the packet.

5 The vehicle 12 includes a plurality of switches 128, 130 and 132. These switches are generally pre-set at the factory to indicate a particular Arabian number such as the number "5". However, the number can be modified by the user to indicate a different number if two central stations are connected together as discussed above and if both stations have vehicles identified by the numeral "5". The number can be modified by the user by changing the pattern of closure of the switches 128, 130, and 132. The pattern of closure of the switches 128, 130 and 132 controls the selection of an individual one of the vehicles such as the vehicles 12, 14, 16, 17 and 25.

15 The pattern of closure of the switches 128, 130, and 132 in one of the vehicles can be changed when there is only a single central station. For example, the pattern of closure of the switches 128, 130 and 132 can be changed when there is only a single central station with a vehicle identified by the numeral "5" and when another user brings to the central station, from such other user's system, another vehicle identified by the numeral "5".

20 The vehicle 12 also includes a light such as a light emitting diode 134. This diode is illuminated when the vehicle 12 is selected by one of the pads 42a, 42b, 42c and 42d. In this way, the other users can see that the vehicle 12 has been selected by one of the pads 42a, 42b, 42c and 42d in case one of the users (other than the one who selected the vehicle 12) wishes to select such vehicle. It will be appreciated that each of the vehicles 12, 14, 16, 17 and 25 may be generally different from the others so each vehicle may be able to perform functions different from the other vehicles. This is another way for each user to identify the individual one of the vehicles that the user has selected.

25 When the RF receiver 121 receives a stream of packets 200 that have been transmitted by the radio frequency transmitter 104, the microcontroller 124 must decode the received packets to determine the values of each of the bits included in the packet 200. The microcontroller 122 begins the decoding process by determining the duration between pairs

of start bits 202, 204 that have been received. If the duration between pairs of start bits 202, 204 is not within a range of values stored in the read only memory 124, or if the microcontroller 122 detects only one start bit 204, the microcontroller 122 may determine that the packet 200 has been corrupted or is otherwise undecodable. The microcontroller continues  
5 to analyze the pairs of start bits 202, 204 until the duration between successive pairs of the start bits 202, 204 is within the range of values stored in the read only memory 124.

The microcontroller determines a bit duration for each of the bits contained within the packet 200 by dividing the interval of time measured between two successive pairs of start bits by sixteen, the number of data bits in a valid packet 200. In this manner, the  
10 microcontroller 122 determines the bit duration during processing, allowing for variation in bit duration that may be caused by variations in the transmitted stream of packets, and allowing the microcontroller 122 to synchronize the analysis of the values of the bits contained within the packet 200. One advantage of determining the bit duration on the fly in this manner by analyzing the duration between pairs of start bits 202, 204 is that the  
15 microcontroller may recover from a loss of synchronization caused by corrupted packets 200 having fewer or more than sixteen bits within one packet cycle. This rapid recovery of synchronization is advantageous in that it promotes efficient use of the radio frequency bandwidth by not requiring an excessive number of packet cycles for recovery, thus preventing annoying lags in the response of the vehicle to switch closures on the pads 42a,  
20 42b, 42c and 42d.

The capability of the microcontroller 122 to adapt to variations in the timing of the bits in the packets 200 provides the potential for future upgrades in the rate of transmission of the signals from the central station 64 while maintaining the usefulness of the microcontroller 122 in the vehicles. For example, future developments in the central station  
25 64 may include increasing the transmission rate of the packets 200, resulting in decreased packet and bit durations. The microcontroller 122 in the vehicles 12, 14, 16, 17 and 25 may adapt to the decreased packet and bit durations because the microcontroller 122 synchronizes and decodes the packets 200 on the fly, thus ensuring that older vehicles continue to work with the upgraded central station 64.

When the received packet 200 has been decoded by the microcontroller 122, the microcontroller 122 enables a signal to the motors 28, 30, 32 and 33 according to the values of the bits in the packet 200. The microcontroller may continue to enable the signal until the signal has been enabled for a period of time equal to a value stored in the read only memory 124. For example, each motor enabling signal provided by the microcontroller 122 may be continued for 0.25 seconds, unless the microcontroller receives a command from a later received packet 200 to discontinue the motor enabling signal. One advantage of such a continuation of the enabling signal is that it promotes smooth movement of the vehicle where radio frequency noise in the operating environment results in the reception of spurious or corrupted packets 200 by the RF receiver 69. Reception of such spurious or corrupted packets 200 without the continuation of the enabling signal may result in undesired discontinuous or jerky motion of the vehicle, or a degradation of the fine control of the vehicle necessary to allow the vehicle to maneuver in close quarters. Additionally, the continuation of the enabling signal allows the microcontroller 122 to overcome periods of lower than normal operating voltage caused when one of the motors 28, 30, 32 and 33 start up and the battery charge is low. The motors 28, 30, 32 and 33 require, for example, 80 milliamperes of current to operate when they are operating at full speed. These same motors, however, may require as much as 200 milliamperes to start up when they have not been operating. Thus current requirement may cause as much as a 0.5 volt voltage drop in the operating voltage of the vehicle for a period of up to 0.1 seconds. When the battery charge is low, which may occur after prolonged use of the vehicle or when the vehicle has been idle, but the battery has not been recharged for an extended period of time, this voltage drop may be sufficient to cause the operating voltage available to power the vehicle to fall below the minimum voltage required to power the RF receiver thus momentarily preventing the reception and decoding of packets 200 of data. Continuing the enabling signal provided to the motors 28, 30, 32 and 33 by the microcontroller 122 overcomes this problem by allowing the vehicle to continue to operate until the operating voltage increases as the motor comes up to speed and the RF receiver 121 recovers.

As previously indicated, the user of one of the pads such as the pad 42a selects the vehicle 12 by successively depressing the button 58 a particular number of times within



a particular time period. This causes the central station 64 to produce an address identifying the vehicle 12. When this occurs, the central station 64 stores information in its random access memory 98 that the pad 42a has selected the vehicle 12. Because of this, the user of the pad 42a does not thereafter have to depress the button 58 during the time that the pad 42a is directing commands through the station 64 to the vehicle 12. As long as the buttons on the pad 42a are depressed within a particular period of time to command the vehicle 12 to perform individual functions, the microcontroller 94 in the central station 64 will direct the address of the vehicle 12 to be retrieved from the read only memory 96 and to be included in the packet of the signals transmitted by the central station to the vehicle 12.

The read only memory 96 in the microcontroller 94 at the central station 64 stores information indicating a particular period of time in which the vehicle 12 has to be addressed by the pad 42a in order for the selective coupling between the pad and the vehicle to be maintained. The random access memory 98 in the microcontroller 94 stores the period of time from the last time that the pad 42a has issued a command through the central station 64 to the vehicle 12. When the period of time in the random access memory 98 equals the period of time in the read only memory 96, the microcontroller 94 will no longer direct commands from the pad 42a to the vehicle 12 unless the user of the pad 42a again depresses the button 58 the correct number of times within the particular period of time to select the vehicle 12.

The vehicle 12 also stores in the read only memory 124 indications of the particular period of time in which the vehicle 12 has to be addressed by the pad 42a in order for the selective coupling between the vehicle and the pad to be maintained. This period of time is the same as the period of time specified in the pervious paragraph. The random access memory 126 in the microcontroller 122 stores the period of time from the last time that the pad 42a has issued a command to the vehicle 12.

As previously indicated, the button 58 in the pad 42a does not have to be actuated or depressed to issue the command after the pad 42a has initially issued the command by the appropriate number of depressions of the button. When the period of time stored in

the random access memory 126 of the microcontroller 122 in the vehicle equals the period of time in the read only memory 124, the microcontroller 122 issues a command to extinguish the light emitting diode 134. This indicates to the different users of the system, including the user previously controlling the operation of the vehicle 12 that the vehicle is available to be selected by one of the users including the user previously directing the operation of the vehicle.

When one of the vehicles such as the vehicle 12 is being moved in the forward direction, the random access memory 126 records the period of time during which such forward movement of the vehicle 12 is continuously occurring. This period of time is continuously compared in the microcontroller 122 with a fixed period of time recorded in the read only memory 124. When the period of time recorded in the random access memory 126 becomes equal to the fixed period of time recorded in the read only memory 124, the microcontroller 122 provides a signal for increasing the speed of the movement of the vehicle 12 in the forward direction. If the vehicle continues to be commanded to be moved forward, the period of time since the speed was increased may again be recorded in the random access memory 126 and is again continuously compared in the microcontroller 122 with a fixed period of time recorded in the read only memory 124. When the period of time recorded in the random access memory 126 becomes equal to the fixed period of time recorded in the read only memory 124, the microcontroller 122 provides a signal to further increase the speed of the movement of the vehicle 12. The microcontroller may continue the cycle of monitoring the time of movement and providing signals to increase the speed of movement of the vehicle up to a predetermined number of cycles, the number of which may be stored in the read only memory 124. Similar arrangements are provided for each of the vehicles 14, 16 and 17. This increased speed may illustratively be twice, three times or more than that of the original speed.

As described above, each of the vehicles 12, 14, 16, 17 and 25 has a plurality of motors 28, 30, 32 and 33. When one of these motors is energized by the microcontroller 122 as described in the previous paragraph, the microcontroller 122 records a value representative of the speed of the motor in the random access memory 126. If the

microcontroller 122 receives a packet 200 of data from the central station 64 commanding the energization of a second or third one of the motors 28, 30, 32 and 33, the microcontroller 122 provides a signal to the transistor driver 120 associated with that second or third one of the motors 28, 30, 32 and 33 to start and run that motor at the speed recorded in the random access memory 126 representative of the current operating speed of the first of the motors 28, 30, 32 and 33 to be energized. If both motors continue to be energized for a period of time exceeding the period of time stored in the read only memory 124 as described previously, the transistor drivers 120 associated with all of the motors energized at that instant receive signals from the microcontroller 122 to increase the speed of the motors to the next level.

The microcontroller 122 continuously monitors the RF receiver 121 for RF packets 200 transmitted by the central station 64. While the central station is turned on, the RF transmitter 104 continuously transmits packets 200 of information regarding the status of the switch closures of the pads 42a, 42b, 42c and 42d, as well as any special commands that are required. The RF receiver of each of the vehicles 12, 14, 16, 17 and 25 is responsive to the presence of RF packets 200 that carry the unique combination of identifier bits 206, 208, 210 and 212 assigned to a particular vehicle as described above. If the RF receiver 69 of a particular one of the vehicles does not receive a command for a predetermined period of time, the value of which is stored in the read only memory 124, the microcontroller 124 infers that the vehicle is not being used by an operator, and places the vehicle in a powered, but inactive state.

When a vehicle is in the powered, but inactive state and the microcontroller 122 determines that a packet 200 addressed to the particular vehicle has been received, it stores the values of bits of the packet 200 in the random access memory 126, and continues to monitor the output of the RF receiver 121. If the microcontroller 122 detects another packet 200 addressed to it, it compares the newly received packet 200 with the stored packet. If the received and stored packets are identical, and the received packet has been detected within a predetermined period of time stored within the read only memory 124, the microcontroller 122 recognizes that its vehicle has been selected by the operator of one of the pads 42a, 42b, 42c and 42d. The microcontroller 122 then enters a "powered and selected" state and causes

the light emitting diode 134 to change from a blinking light to a constant light. The requirement that the microcontroller 122 detect two identical packets 200 addressed to it is advantageous in eliminating spurious "glitching" of the RF system of the vehicle. This is necessary because of the amount of RF "noise" present under even routine operating conditions, which can adversely impact the precise control of the vehicles necessary.

As will be discussed in more detail below, the microcontroller 122 also continuously monitors the received packets to determine if the packets are valid. For example, the microcontroller 122 may determine whether the packets comprise the correct number of non-conflicting data bits, with each bit having an allowed value. Once the microcontroller 122 has entered the powered and selected state, each valid packet of information received by RF receiver 121 and addressed to the vehicle is considered by the microcontroller 122 to be a valid command, and is acted on accordingly by the microcontroller 122 to control the motors 28, 30, 32 and 33 of the vehicle.

The identities of the last two vehicles selected by a pad are stored in a flashback queue stored in the random access memory 82 (Figure 2). If the pad is automatically deselected as described above because no buttons on the pad have been pushed during the predetermined interval stored in the read only memory 80, the first actuation of any button on the deselected pad causes the central station 64 to attempt to automatically log onto the last vehicle selected by that pad. When the selected vehicle is already selected by another one of the pads 42a, 42b, 42c and 42d, the automatic log onto the vehicle will succeed only if switch 65 on the pad currently controlling the vehicle has been set in the second position to enable the second mode allowing control of the vehicle to be shared by other pads.

When the first automatic log on attempt is unsuccessful because the last vehicle controlled by the pad is already selected by another pad that is not set in the second mode, the central station attempts to log on to the second to last vehicle controlled by the pad. This second automatic log on attempt is also sensitive to the state of the mode setting of another pad already controlling the vehicle. If this second automatic log on attempt is unsuccessful, then the central station attempts to log on to each of the vehicles 12, 14, 16, 17 and 25 in

turn, beginning with the vehicle identified by the Arabian number "1" until a log on attempt is successful.

5 In order to optimize the transmission of packets, and also to conserve battery energy in vehicles that are in the powered, but inactive state, the microcontroller 94 of the central station may only execute the automatic log on attempt when a command signal is provided by the pad 42a, 42b, 42c and 42d. In other words, the automatic log on may only be attempted when one of the buttons 44, 47, 49, 56, 58, 60a, 60b, 61a and 61b are actuated to command the movement of a vehicle. Actuation of button 65, however, since button 65 does not control any of the motors 28, 30, 32 and 33 of the vehicles, may not initiate the  
10 automatic log on attempt.

An additional feature of the system of the present invention that utilizes the flashback queue may be activated when an operator presses button 47 on a pad 42a, 42b, 42c and 42d. Actuation of button 47 closes switch 53 and causes the pad to deselect the vehicle currently controlled by the pad, and attempt to log on to the last vehicle controlled by the pad  
15 before the current vehicle was selected by pressing button 58 the required number of times. This feature may also be sensitive to the state of the mode select switch 65 on a pad controlling the vehicle on which the automatic log on is attempted. If the vehicle is currently controlled by another of the pads 42a, 42b, 42c and 42d, then the automatic log on attempt after pressing button 47 will be successful only if the switch 65 on the other pad is set to  
20 enable the second, shared control, mode. As before, if the automatic log on attempt caused by pressing button 47 is unsuccessful, then an attempt will be made to log on to the second to last vehicle controlled by the pad. One difference between the automatic log on attempts made when the pad has been deselected and the attempts enabled by pressing button 47 is that the latter may make no further attempts to log on to any other vehicles if the second  
25 automatic log on attempt is unsuccessful.

One advantage of the arrangement of bits in the packet 200 is that the bits 214, 216, 218 and 220 are representative of switch actuations of the pads 42a, 42b, 42c and 42d that may be mutually exclusive. The bits 214, 216, 218 and 220 may be given values by the

microcontroller 94 of the central station 64 that would normally be interpreted by the microcontroller 122 of the vehicles 12, 14, 16, 17 and 25 as illegal commands. For example, the case where the value of bits 214 and 216 are both binary 1, representing switch actuations on one of the pads 42a, 42b, 42c and 42d to command a vehicle to simultaneously move in  
5 a forward and a backward direction would be interpreted by the microcontroller 122 as an illegal command, and would be ignored by the microcontroller 122. This may occur, for example, where the vehicle identified by bits 206, 208, 210 and 212 is being controlled by two or more pads, as described previously. In such a case, the operator of one of the pads may push button 44, for example, to actuate switch 46 to command the vehicle to move  
10 forward (Figure 2). At the same instant, the operator of the other pad controlling the vehicle may push button 44 to actuate switch 48 to command the vehicle to move backwards. The microcontroller 94 would form a packet 200 in response to these commands directed to the selected vehicle having a value of binary 1 in each of the bits 214 and 216. As stated, the microcontroller 122 of the vehicle would interpret such a packet 200 as an illegal packet, and  
15 would not provide signals to the transistor drivers 120 of the motors 28, 30, 32 and 33 (Figure 4) in accordance with the values of the bits 214 and 216 of the packet 200. In one embodiment of the invention, such illegal commands could instead be used to signal the microcontroller 122 that the bits following the illegal command bits contain instructions to carry out a special command.

20 A particular sequence of otherwise illegal combinations of values of the bits 214, 216, 218 and 220 associated with a special command may be stored in the read only memory 124. It will be understood that more than one illegal sequence of bits 214, 216, 218 and 220 is possible; thus the read only memory 126 may contain as many sequences representing special commands as there are illegal sequences of bits 214, 216, 218 and 220.  
25 When the RF receiver 121 receives a transmitted packet 200, the sequence of bits comprising the packet 200 is stored in the random access memory 126. The microcontroller 122 compares the sequence of bits 214, 216, 218 and 220 stored in the random access memory to the sequences stored in the read only memory 126, and if there is a match, the microcontroller 122 executes the special command associated with the sequence of bits 214,  
30 216, 218 and 220. Such special commands may include, by way of illustration and not

limitation, commands to power down the vehicle, reset the microcontroller 122 or to immediately cause the microcontroller 122 to enter the "powered, but inactive" state.

If the microcontroller 122 determines that none of the sequences of bits 214, 216, 218 and 220 stored in the read only memory 124 matches the sequence of bits stored in the random access memory 126, the microcontroller determines that the sequence of bits 214, 216, 218 and 220 stored in the random access memory 126 is an illegal sequence of bits not associated with any special command. The microcontroller 122 may then ignore the entire packet 200 or the microcontroller 122 may interpret and execute commands associated only with bits whose values represent legal commands.

Accessories connected to the smart port 115 of the central station 64 may also provide signals to the microcontroller 94 of the central station 64 to be transmitted to the vehicles 12, 14, 16, 17 and 25. While bit 236 of the packet 200 is normally used by the microcontroller in an accessory to instruct the microcontroller 94 of the central station 64 to perform some activity, such as sounding a horn, bit 236 may also be used to indicate that the values of the bits in the packet 200 should be interpreted as special commands, rather than their usual meanings. For example, where the accessory connected to the smart port 115 instructs the microcontroller 94 of the central station 64 to transmit a special command, the microcontroller of the accessory may set the value of bit 236 to a binary 1. When the packet containing this bit is received by the desired vehicle, the packet 200 of bits is stored in the random access memory 126 and the value of bit 236 instructs the microcontroller 122 of the vehicle to compare the values of the data bits 214, 216, 218, 220, 222, 224, 226 228, 230, 232 and 234 to sequences of bits stored in the read only memory 124 associated with special commands generated by the accessory connected to the smart port 115 of the central station 64. If the microcontroller 122 then executes the special commands to control the motors 28, 30, 32 and 34, or other auxiliary equipment or devices that may be in use that is associated with the vehicle or device identified by the bits 206, 208, 210 and 212 of the packet 200.

Since the vehicle 12 is battery powered, various systems and processes are incorporated within the programming of the microcontroller 122 and the read only memory

124 to optimize the power utilization of the vehicle. For example, when the microcontroller 122 has not detected any packets addressed to the vehicle for the predetermined period of time stored in the read only memory 124, the microcontroller automatically places the vehicle in the powered, but inactive state.

5           As described above, the central station 64 transmits a continuous stream of packets 200 when the central station is powered. If the central station is turned off, the microcontroller 94 of the central station 64 may, as it powers down the central station 64, send a special command to the vehicles to enter a powered down state. Alternatively, the microcontroller 122 in the vehicle may cause the vehicle to automatically enter the powered down state if no  
10 RF packets 200 transmitted by the central station 64 are received for a predetermined period of time stored within the read only memory 124. As mentioned previously, the normal operating environment may contain a high level of random RF "noise" that may be detected by the microcontroller 122. Accordingly, the microcontroller may be programmed with the capability of filtering the signals received by the RF receiver 121 to eliminate spurious  
15 packets. The microcontroller 122 may determine that RF packets are being transmitted by the central station 64 only if a percentage of the packets received during a predetermined time are determined to be valid packets 200. For example, fifty percent of the packets received during one second may be determined by the microcontroller 122 to be valid or the microcontroller will begin powering down the vehicle. Such a determination by the microcontroller 122 may,  
20 for example, include determining whether the received packet 200 contains the correct number of data bits.

          If the microcontroller 122 determines that the vehicle should be powered down, it may provide a visual signal to the operators of the system by causing the light emitting diode 134 to blink at a rate obviously different from the blink rate identifying the powered,  
25 but inactive state. For example, the light emitting diode may blink at twice the rate for one minute. At the end of the predetermined time, if the microcontroller 122 has still not detected any valid RF packets, the microcontroller causes the vehicle to be completely powered down, and removes the power from the light emitting diode 134, causing it to go dark.



Further energy optimization may be achieved by utilizing pulse width modulation techniques to energize the motors 28, 30, 32 and 33. For example, the speed of the motors 28, 30, 32 and 33 may be controlled at three different levels by applying power to the motor for one third of a power cycle to achieve a first speed, for two thirds of power  
5 cycle to achieve a second speed, and continuously throughout the power cycle to achieve a third, maximum speed. Thus, a power cycle may typically have three time slices.

The microcontroller 122 may select which of the three time slices to apply power to the selected one of the motors 28, 30, 32 and 33 to achieve the desired speed. For example, the first speed may be achieved by applying power to the selected motor during any  
10 one of the three time slices, and the second speed may be achieved by applying power during any two of the three time slices, while the third speed is achieved by applying power during all three of the time slices.

In a preferred embodiment, the microcontroller 122 applies power to the selected one of the motors 28, 30, 32 and 33 in the first time slice available after the packet  
15 200 of data containing the command to energize the motor is received and decoded. Selecting the first available time slice in this manner to provide power to the selected motor provides improved response of the vehicle to switch actuations on the pads 42a, 42b, 42c and 42d to enhance control and maneuverability of the vehicles 12, 14, 16, 17 and 25 by the operator.

Referring now to FIG. 7, the interface between the microcontroller 94 of the  
20 central station 64 and the pads 42a, 42b, 42c and 42d is shown in more detail. As described previously, all of the data and control signals passing between the microcontroller 94 of the central station 64 and the pads 42a, 42b, 42c and 42d is conveyed over three lines.

In a preferred embodiment, the microcontroller 94 has nine input/output (I/O)  
25 lines 84, 86a, 86b, 86c, 86d, 88a, 88b, 88c and 88d devoted to determining the status of the switch closures of the switches in switch matrix 43 of the pads 42a, 42b, 42c and 42d and for modifying the status of the light emitting diodes 93 of the pads (Figure 2). Line SEL% 84 is a common line connected to a corresponding input/output port on each of the pads 42a, 42b, 42c and 42d. There are four SCLK I/O lines 86a, 86b, 86c and 86d connected to

corresponding I/O ports on the pads 42a, 42b, 42c and 42d. Specifically, SCLK line 86a is connected to I/O port SCLK0 on pad 42a, SCLK line 86b is connected to I/O port SCLK1 on pad 42b, SCLK line 86c is connected to I/O port SCLK2 on pad 42c and SCLK line 86d is connected to I/O port SCLK3 on pad 42d. Similarly, SDATA line 88a is connected to I/O port SDATA0 on pad 42a, SDATA line 88b is connected to I/O port SDATA1 on pad 42b, SDATA line 88c is connected to I/O port SDATA2 on pad 42c and SDATA line 88d is connected to I/O port SDATA3.

This architecture allows the microcontroller 122 to read the status of the switch closures of switch matrix 43 from all four pads 42a, 42b, 42c and 42d simultaneously in parallel fashion, or alternatively, to read the status of an individual one of the pads 42a, 42b, 42c and 42d. As will be described in more detail with reference to Figures 8 and 9, the microcontroller 94 may read the status of the pads 42a, 42b, 42c and 42d by sending appropriate signals over the SEL% line 84 and the SCLK lines 86a, 86b, 86c and 86d. When the microcontroller 92 sends the appropriate signal over SEL% line 84, and sends the identical appropriate signal over the SCLK lines 86a, 86b, 86c and 86d, the status of the switch closures of each of the pads 42a, 42b, 42c and 42d is read simultaneously by the microcontroller 94 over the SDATA lines 88a, 88b, 88c and 88d. Alternatively, the microcontroller 94 may provide the appropriate signal over a selected one or ones of the SCLK lines 86a, 86b, 86c and 86d. Thus, the microcontroller 94 reads the status of the switch closures only of the pads 42a, 42b, 42c and 42d receiving the signal over the selected one or ones of the SCLK lines 86a, 86b, 86c and 86d. In like manner, the microcontroller may provide the appropriate signals over the SEL% line 84 and the SCLK lines 86a, 86b, 86c and 86d to enable the pads 42a, 42b, 42c and 42d to receive signals to update the status of the light emitting diodes 93 (Figure 2) over the SDATA lines 88a, 88b, 88c and 88d either simultaneously or selectively.

One advantage to using a common SEL% line connecting all of the pads 42a, 42b, 42c and 42d is that it eliminates three input/output lines, allowing the use of a less expensive microcontroller 94. A further advantage is that the pads 42a, 42b, 42c and 42d are not connected in series. Thus, selected ones of the pads 42a, 42b, 42c and 42d may be either

connected or disconnected from the central station without affecting the operation of microcontroller 94 or the central station 64. As mentioned previously, the microcontroller 94 is capable of detecting whether a pad is connected to the central station 64, and immediately recognize when a pad is connected or disconnected. In the event a pad is disconnected, the  
5 microcontroller 94 may discontinue sending signals over the SCLK lines 86a, 86b, 86c and 86d and the SDATA lines 88a, 88b, 88c and 88d associated with the disconnected pad to read the status of the pad or to update the status of the light emitting diodes 93 of the pad. When a pad is connected to a central station 64 that is already in use, the microcontroller 94 may immediately begin providing signals over the SCLK lines 86a, 86b, 86c and 86d and the  
10 SDATA lines 88a, 88b, 88c and 88d associated with the newly connected pad to read the status of the switch closures of the pad and to update the status of the light emitting diodes 93 of the pad.

Referring now to FIGS. 8 and 9, the operation of the logic used in each of the pads 42a, 42b, 42c and 42d to provide the status of the switch closures of the switch matrix  
15 43 to the central station 64 will be described. In a preferred embodiment of the invention, the pads 42a, 42b, 42c and 42d include a programmable logic device, generally indicated at 290, having the components illustrated in the block diagram depicted in Figure 8. While a programmable logic device 290 is depicted, it will be understood by those skilled in the art that the same functions may be carried out by a microcontroller 76 as shown in Figure 4.

As described previously, the switch matrix 43 comprises a plurality of switches, such as switches 46, 48, 50, 52, 62a, 62b, 63a, 63b, 51, 53, 57, 59 and 65. As depicted in  
20 FIG. 8, the switch matrix 43 may also contain additional switches that may be used to provide additional functions. Each of the switches in the switch matrix 43 is coupled to an input line of an input shift register 300. An input buffer 302 is disposed between each switch of the  
25 switch matrix 43 and the corresponding input line of the input shift register 300.

The input shift register 300 may be a parallel input/serial output shift register. In the embodiment of the invention depicted in FIG. 8, the input shift register 300 has sixteen input lines labeled IN0 to IN15. The state of each of the input lines IN0 - IN15 determines

the value of a single bit of the input shift register 300. For example, closure of switch 59 results in the output of the input buffer 302 connected to switch 59 having a voltage increase that causes a binary 1 to be stored in the bit connected to input line IN0 when the shift register 300 is triggered to load. Similarly, when switch 59 is open, the output of the input  
5 buffer 302 connected to input line IN0 is low, resulting in a binary 0 being stored in the bit connected to input line IN0 when the input shift register 300 is triggered to load. Since each switch of the switch matrix 43 is connected to a corresponding one of the input lines IN0 - IN15 of the input shift register 300, the state of each of the switches of the switch matrix 43 may be captured simultaneously, or on a parallel basis, with the state of the other switches,  
10 by the input shift register 300.

The SDATA line 88 may be driven by either the microcontroller 94 in the central station 64 or the programmable logic device 290 of the pad 42a, 42b, 42c and 42d. When the SEL% 84 line is driven by the microcontroller 94 of the central station 64, it is driven with a signal that may be an alternating signal. This alternating signal is input into a  
15 Schmidt trigger 304 which results in a signal on line 308 having high and low states, as depicted in FIG. 9. Similarly, the SCLK signal on line 86 is input into a Schmidt trigger 306 resulting in a signal on line 310 having alternating high and low states. While Schmidt triggers 304, 306 are described, any input buffer may be used. The SDATA line 88 is enabled to be driven by the pad whenever the SEL% signal on line 308 is high (the read state); thus, the microcontroller 94 stops sending data signals over line SDATA 88 before  
20 providing a signal over line SEL% 84 to set line SEL% 308 high.

The sequence of operations comprising the determination of the status of the switch closures of the switch matrix 43 will now be described with reference to the block diagram of the programmable logic device depicted in Figure 8 and the timing diagram generally indicated at 400 in Figure 9. As depicted on timing diagram line 402 of Figure 9,  
25 the signal on line SEL% 308 is driven high while the signal on SCLK line 310 is low (timing diagram line 406, Figure 9). The transition from low to high on line 308 is input into a clock-in line of a flip flop 312 that is responsive to line 310 being driven high to drive the prime signal on line 314 high. This transition is depicted at 420 in Figure 9. The high prime

signal on line 314 is input to flip flop 316 which also receives a clock-in signal from SCLK line 310. When the SCLK signal on line 310 is driven high (Figure 9, timing diagram line 406), the flip flop 316 causes the signal on the loadreg line 318 to go high (Figure 9, transition 424), asserting the loadreg signal to the shift register 300. The signal on the  
5 loadreg line 318 is also input into the CLR input line of the flip flop 312. The high level of the signal on the loadreg line 318 resets flip flop 312, causing the signal on the prime line 314 to go low (Figure 9, transition 426).

The combination of a low signal on the prime line 314 and the next transition of the SCLK signal on line 310 from low to high causes the flip flop 316 to reset the signal  
10 on the loadreg line 318 to low (Figure 9, transition 430). The assertion of SCLK while loadreg is high causes the input shift register to capture the signals on the input lines IN0-IN15 representative of the state of the switch closures of the switch matrix 43 in a parallel fashion. Each subsequent transition of the signal on the SCLK line 310 from low to high (Figure 9, timing diagram line 406) while the signal on the loadreg line 318 is low (Figure  
15 9, timing diagram line 408) drives the shift register 300 to serially shift the one of the bits of data stored in the shift register 300 out of the shift register 300 through an output line 322 and an output enableable driver 326 onto the SDATA line 88. As can be seen in FIG. 8, the SEL% line 308 is also connected to the enabler input 324 of the output enableable driver 326. When the signal on the SEL% line 308 is high the output enableable driver 326 allows the  
20 signal on line 324 to pass through the output enableable driver 326 onto SDATA line 88, which is being monitored by the microcontroller 94 of the central station 64. The data signal on line 88 also passes through a Schmidt trigger input buffer 344 onto line 330 which is connected to the in line 332 of the shift register 90. In this arrangement, the signal that is present on the SDATA line 88, whether driven by the pad 42a or the central station 64, is  
25 present on line 330 and at the in line 332 of the shift register 90.

When the microcontroller 94 of the central station 64 has completed the interrogation cycle to read the status of the switch closures of the pads 42a, 42b, 42c and 42d, the microcontroller 94 sends a signal on line SEL% 84 to set the signal on line 308 low (Figure 9, timing diagram line 454). Setting the signal on line 308 low turns off the output

enableable driver 326, halting the flow of data onto the SDATA line 88 from line 322. SDATA line 88 may now be driven by microcontroller 94 of the central station to send signals to the pad to update the status of the light emitting diodes 93 on the pad (Figure 2).

5 The operation of the programmed logic device 290 to update the status of the light emitting diodes 93 (Figure 2) of the pads will now be described with reference to Figure 8 and the timing diagram generally indicated at 450 in Figure 9. As shown in FIG. 8, the SCLK signal on line 310 is used to drive the input and CLR lines of the flip flop 328. The SEL% signal on line 308 is used to drive the output of an inverter 340 to provide a clock signal to the clock-in port of the flip flop 328. In this manner, when the SEL% signal on line  
10 308 is high, the signal on line 350 will be low, and when the SEL% signal on line 308 is low, the signal on line 350 will be high.

The SEL% and SCLK signals on lines 350 and 310 are used to drive the output of an and gate 342 to provide a signal on line 352 to the clock-in port 336 of the shift register 90. In this arrangement, the signal on line 352 is high when the SCLK signal on line 310 is  
15 high and the inverted SEL% signal on line 350 is high. In this way, the signal on line 352 is high only when the microcontroller 94 in the central station 64 is not interrogating the pad to capture data from the input shift register 300.

When the SCLK signal on line 310 is driven high when the signal on line 350 is high (SEL% line 84 being low), the flip flop 328 drives the signal on the outres line 338  
20 high (Figure 9, transition 472). When the signal on line 310 transitions from high to low, the signal on the outres line 338 is driven low and is asserted to the reset line 334 of the shift register 90 (Figure 9, transition 476). Since the signal on line 350 is high as a result of the inversion of the low signal on line 308 by inverter 340, each subsequent transition of the SCLK signal on line 310 from low to high satisfies the condition of the and gate 342 and is  
25 asserted to the clock-in line 336 of the shift register 90. Each subsequent clock signal on line 352 while the signal on outres line 338 is low shifts the value of the SDATA signal on line 330 at in line 332 of the shift register 90 to be shifted into the output line out0 of the shift

register 90. Each successive clocking of the shift register 90 by a transition of the signal on line 352 from low to high shifts the data in each of the registers of the shift register 90 to the next higher output line. For example, the next clock signal on line 352 will shift the value on the out0 line to the out1 line and so forth. The output of the output lines of the shift register 90 are then utilized by the output drivers 354 to light the selected LED of the LED bank 93 (Figure 9, timing diagram lines 452, 458).

It will be understood that the flow of data on line 88 is sequenced with the signals provided on the SEL% line 84 and the SCLK line 86. For example, when a vehicle identified by the Arabian numeral "4" has been selected by the operator of pad 42a, the microcontroller 94 will drive the signal on the SEL% line 84 low while the signal on the SCLK line 86 is high, causing the flip flop 338 to drive the signal on the outres line 338. Setting outres line 338 asserts a reset signal to the reset line 334 of the shift register 90, and also disables the flow of data from the pad to the central station 64.

When the signal on the SCLK line next transitions from high to low (Figure 9, transition 476), the signal on the outres line is driven low, enabling the shift register 90 to accept data on line 330 from the microcontroller 94 of the central station 64. The microcontroller 94 sets the signal line SEL% 84 low. The next time the SCLK signal on line 86 is driven high by the microcontroller 94, shift register 90 will shift the value of the SDATA line 330 (which is high) to the out0 register of the shift register 90 (Figure 9, timing diagram lines 452, 458). The microcontroller 94 then drives the signal on the SDATA line 88 low, which drives the signal at the in line of the shift register 90 low. The microcontroller 94 then drives the signal on the SCLK line 86 from low to high and back to low four times, each time causing the signal on line 352 to transition from low to high and back to low, which results in the shift register 90 shifting the value of the out0 line to the out1 line, then to the out2 line and lastly to the out3 line, which results in the fourth LED in the LED bank to be lit, indicating that the user of the pad 42a has selected the vehicle identified with the Arabian "4". Because the signal on the SDATA line has been driven low, there is no data present at the in port 332 of the shift register 90 to shift into the output register out0 as the

data in the output register out0 is shifted in the out1 register. Thus, each of the registers out0, out1 and out2 are set to binary 0, and the LED's associated with those registers are not lit.

The system and method described above have certain important advantages. They provide for the operation of a plurality of vehicles by a plurality of users, either on a competitive or a co-operative basis. Furthermore, the vehicles can be operated on a flexible basis in that a vehicle can be initially selected for operation by one user and can then be selected for operation by another user after the one user has failed to operate the vehicle for a particular period of time. The vehicles being operated at each instant are also visible by the illumination of the lights 134 on the vehicle. The apparatus and method of this invention are also advantageous in that the vehicles are operated by the central station 64 on a wireless basis without any physical or cable connection between the central station and the vehicles.

Furthermore, the central station 64 is able to communicate with the vehicles in the plurality through a single carrier frequency. The system and method of this invention are also advantageous in that the vehicles can selectively perform a number of different functions including movements forwardly and rearwardly and to the left and the right and including movements of a container or bin or platform on the vehicle upwardly and downwardly or to the left or the right. Different movements can also be provided simultaneously on a coordinated basis.

There are also other significant advantages in the system and method of this invention. Two or more systems can be combined to increase the number of pads 42 controlling the operation of the vehicles 12, 14, 16 and 17. In effect, this increases the number of users capable of operating the system. This combination of systems can be provided so that one of the systems is a master and the other is a slave. This prevents any confusion from occurring in the operation of the system. The system is also able to recharge the batteries in the vehicles so that use of the vehicles can be resumed after the batteries have been charged.



The system and method of this invention are also advantageous in the provision of the pads and the provision of the button and switches in the pads. As will be appreciated, the pads are able to select vehicles and/or stationary accessories through operation of a minimal number of buttons and to provide for the operation of a considerable number of different functions in the vehicles with a minimal number of buttons. In co-operating with the central station, the pads are able to communicate the selection of vehicles to the central station without indicating to the station, other than on a time shared basis, the identities of the vehicles being selected. After selecting a vehicle, each pad does not thereafter have to indicate the identity of the vehicle as long as the pad operates the vehicle through the central station within a particular period of time from the last operation of the vehicle by the pad through the central station.

While several forms of the invention have been illustrated and described, it will also be apparent that various modifications can be made without departing from the spirit and scope of the invention. Accordingly, it is not intended that the invention be limited, except by the appended claims.

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application in the manner provided by the first paragraph of Title 35, United States Code, Sec. 112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, Sec. 1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application.

<u>Appln. Serial No.</u>	<u>Filing Date</u>	<u>Status</u> (patented, pending abandoned)
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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

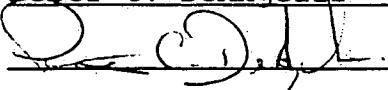
I hereby appoint the following attorneys to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith:

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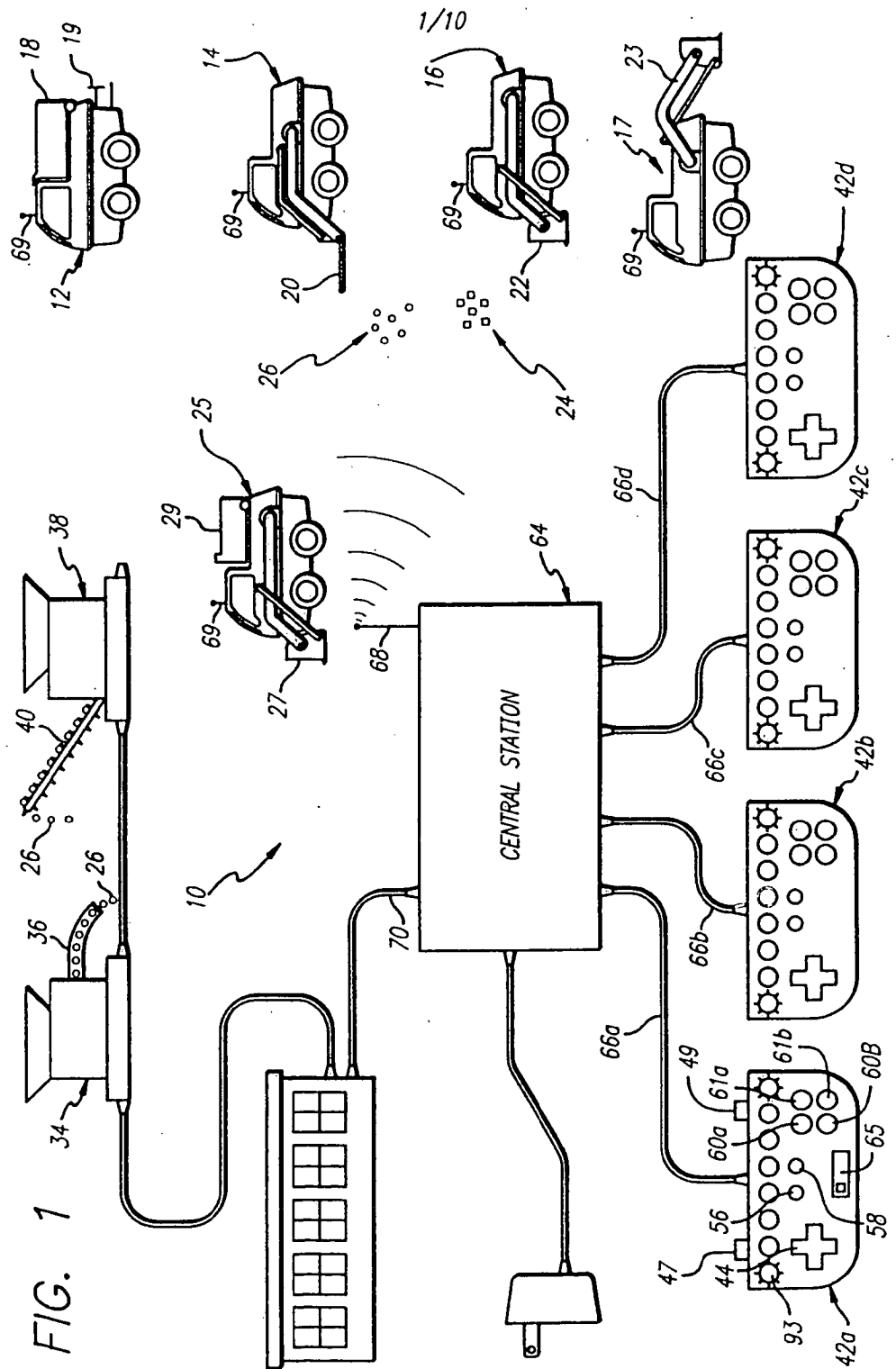
Inventor's signature: 

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Carlsbad, California 92009



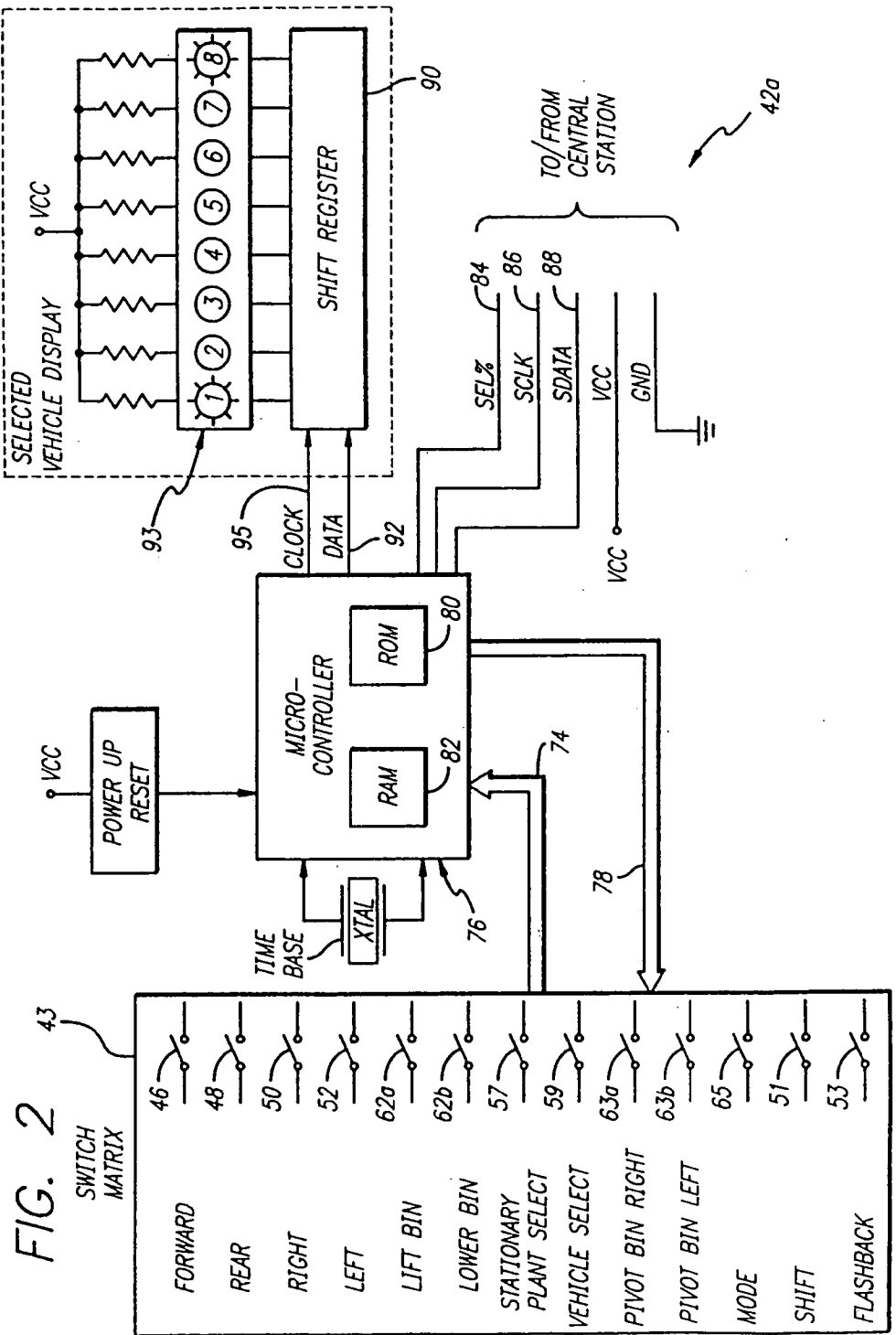


FIG. 3

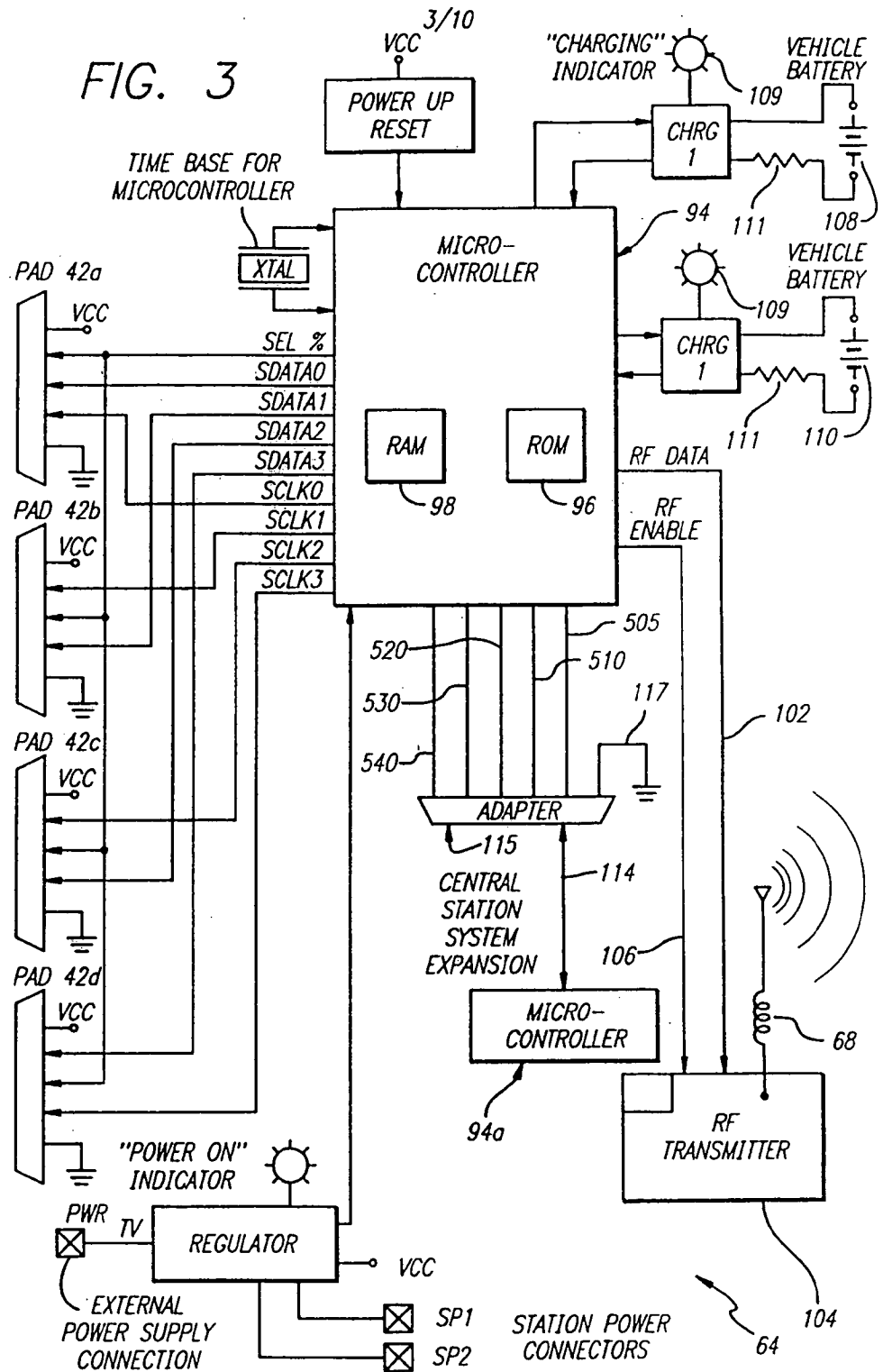


FIG. 4

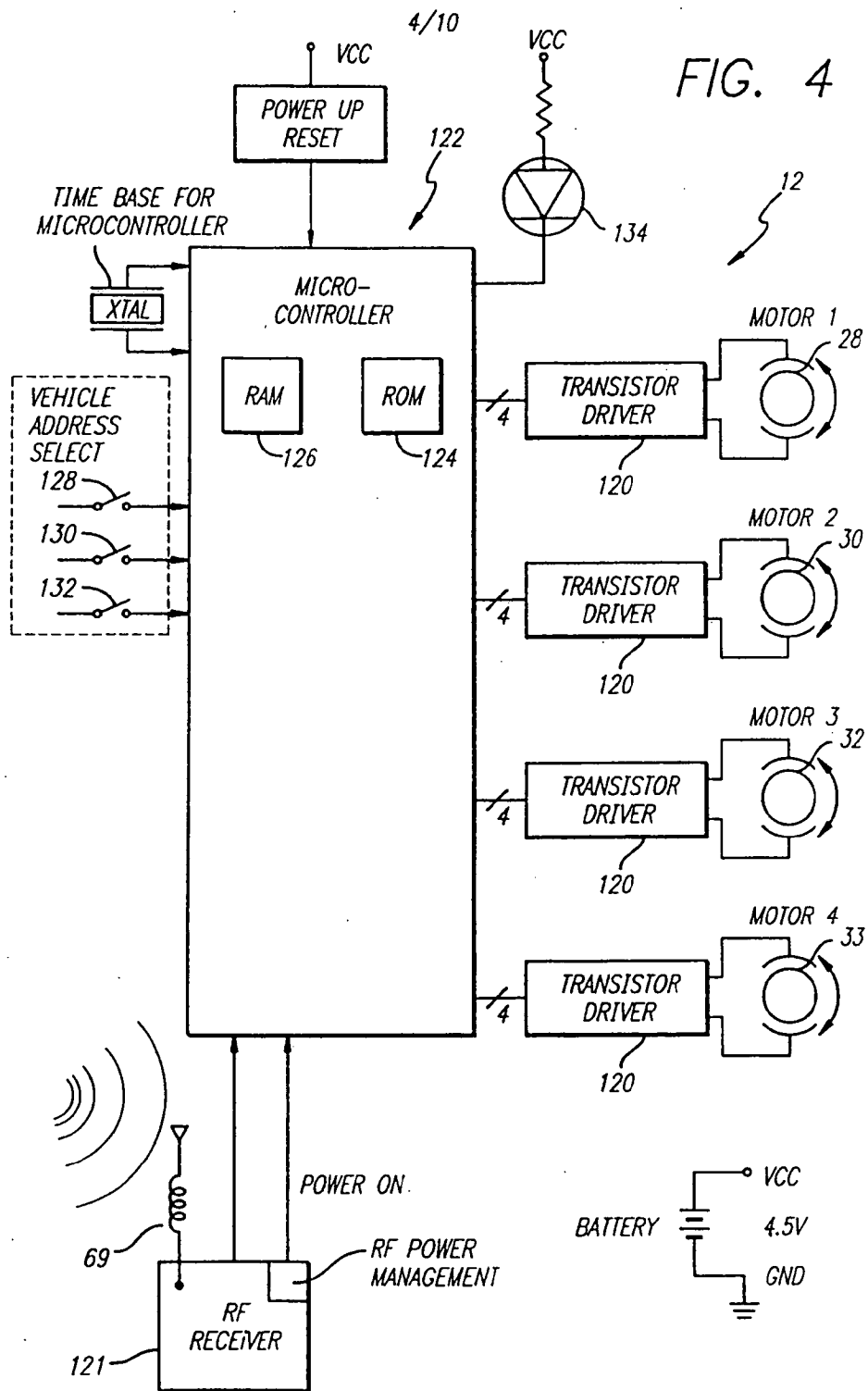




FIG. 5

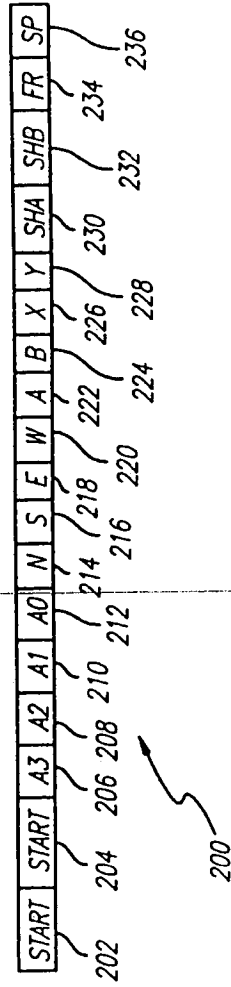


FIG. 6A

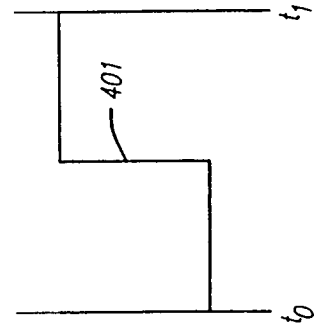


FIG. 6B

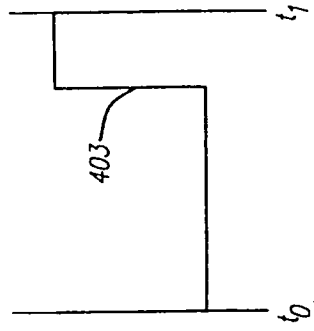
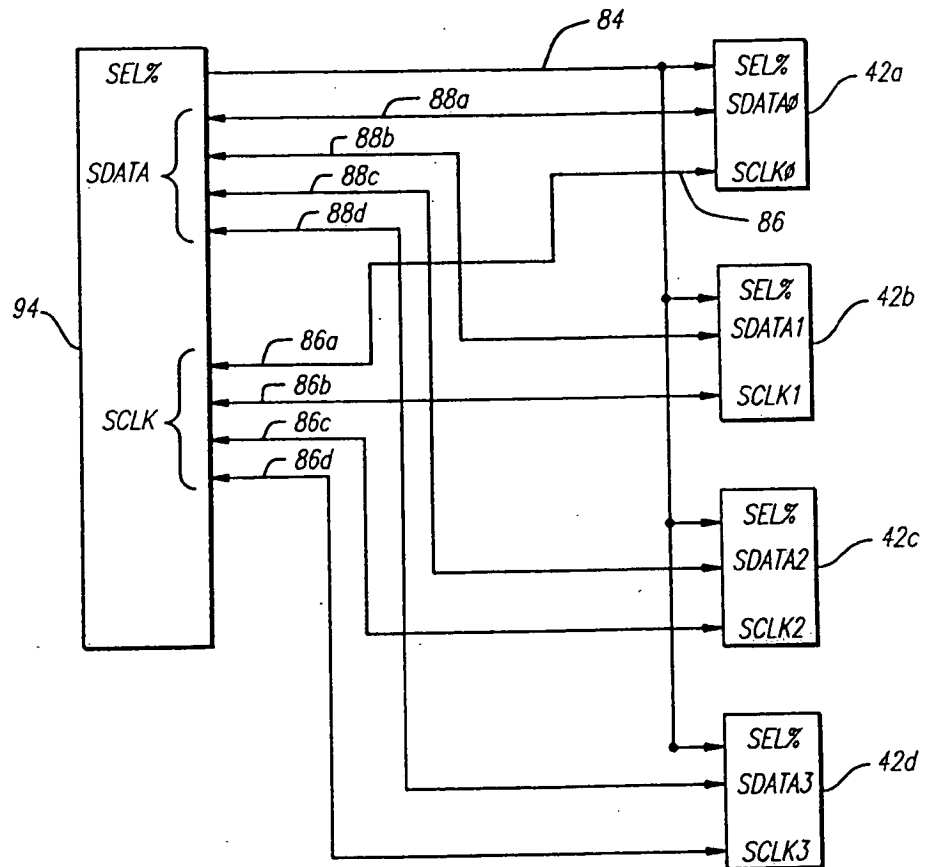


FIG. 7



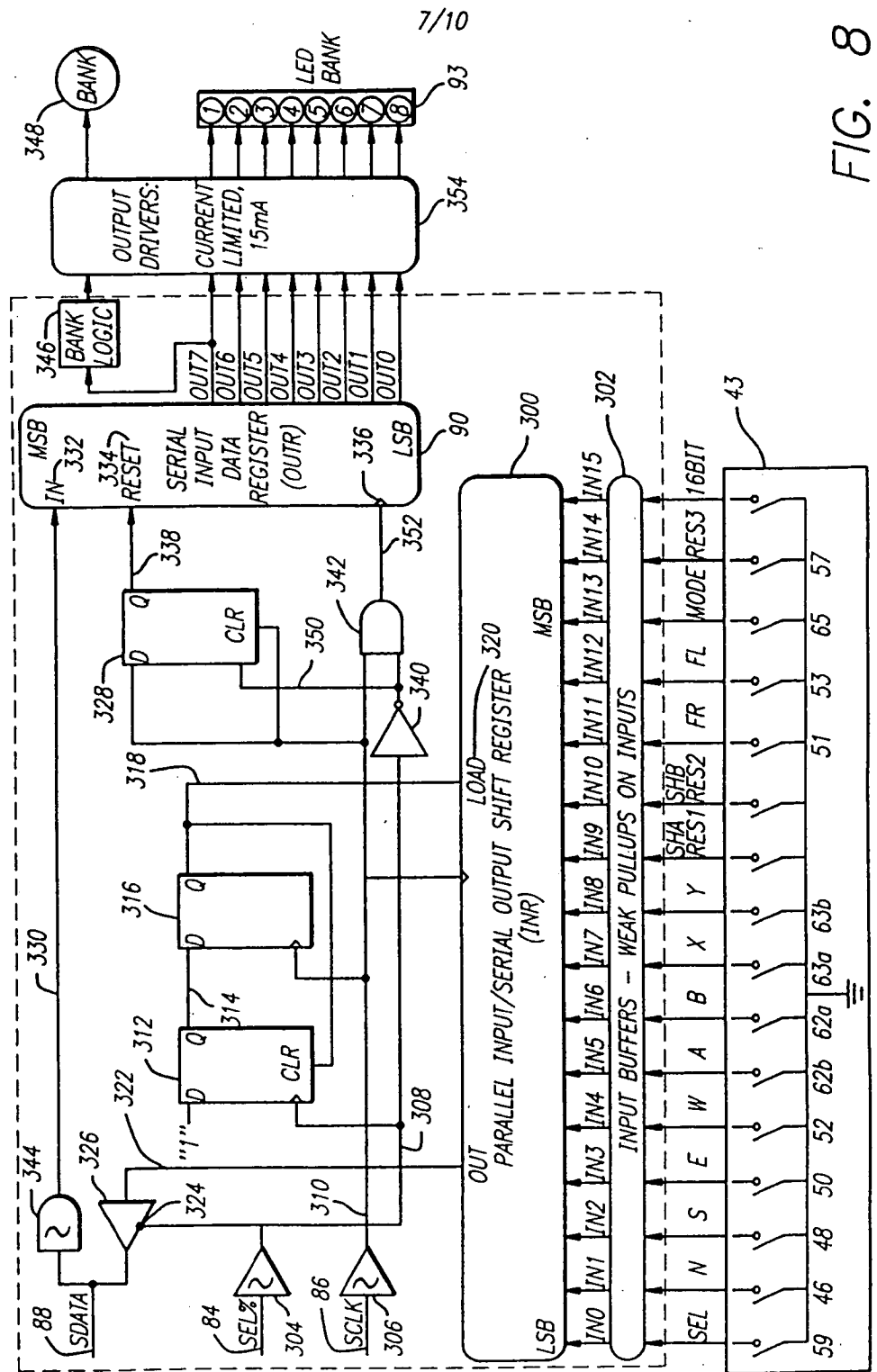


FIG. 8

FIG. 9-1

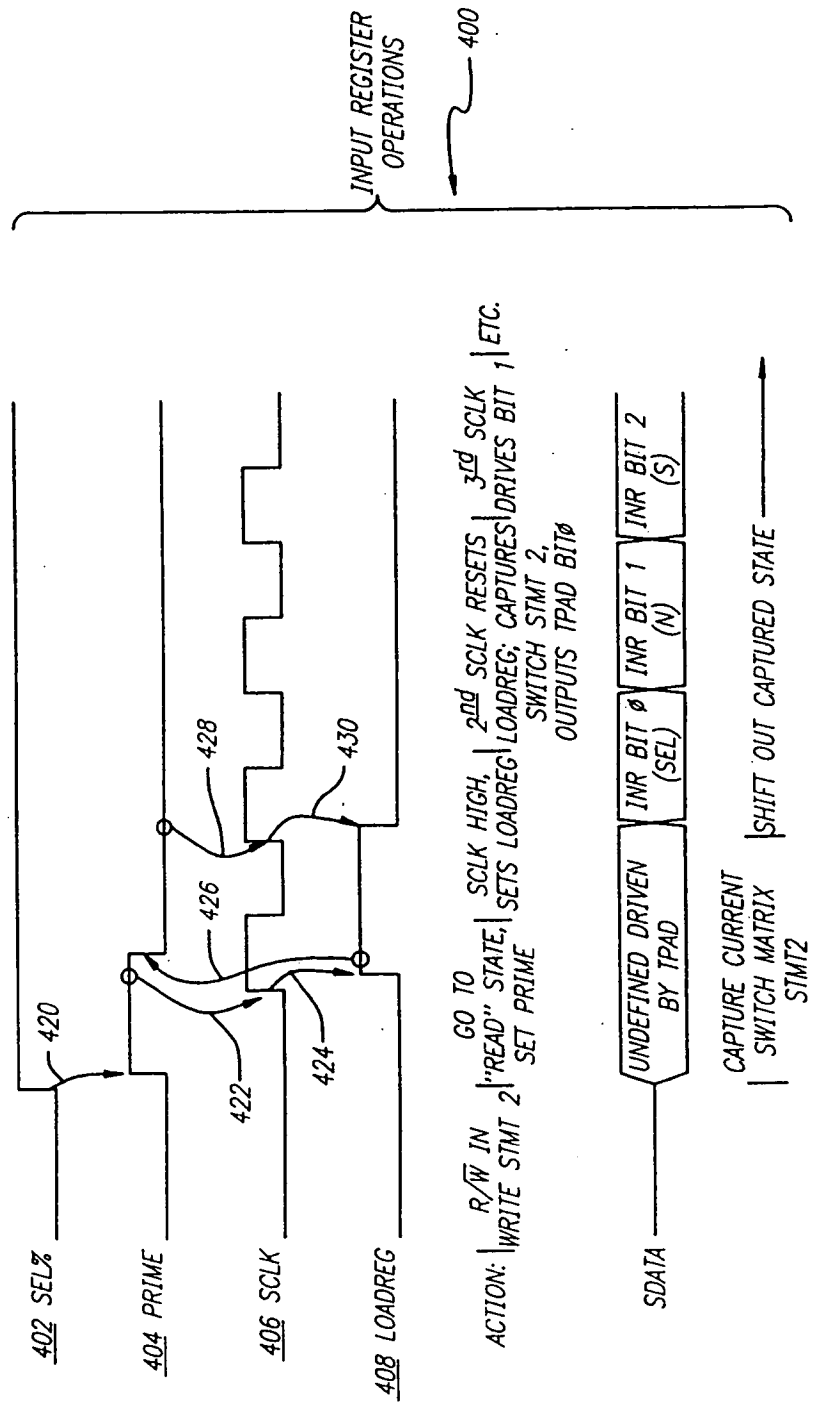
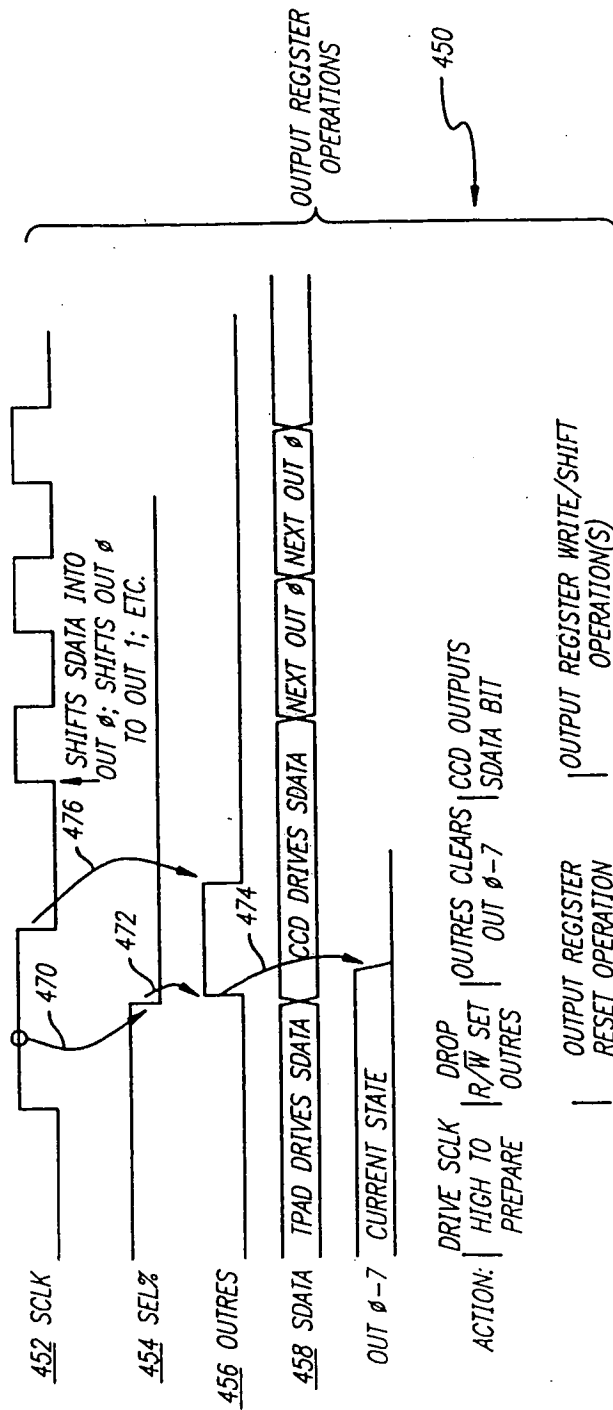
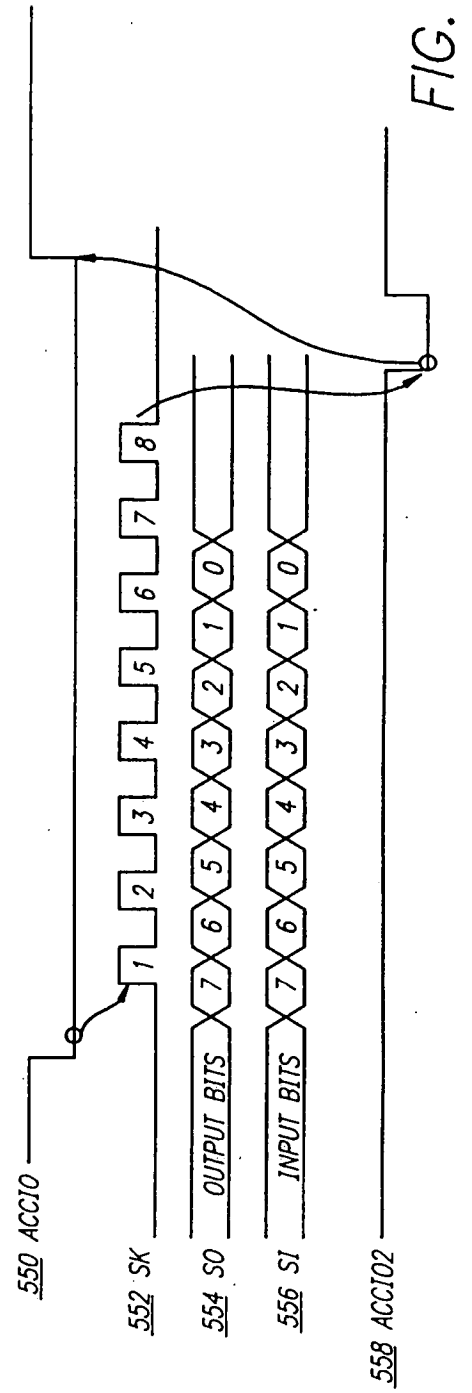
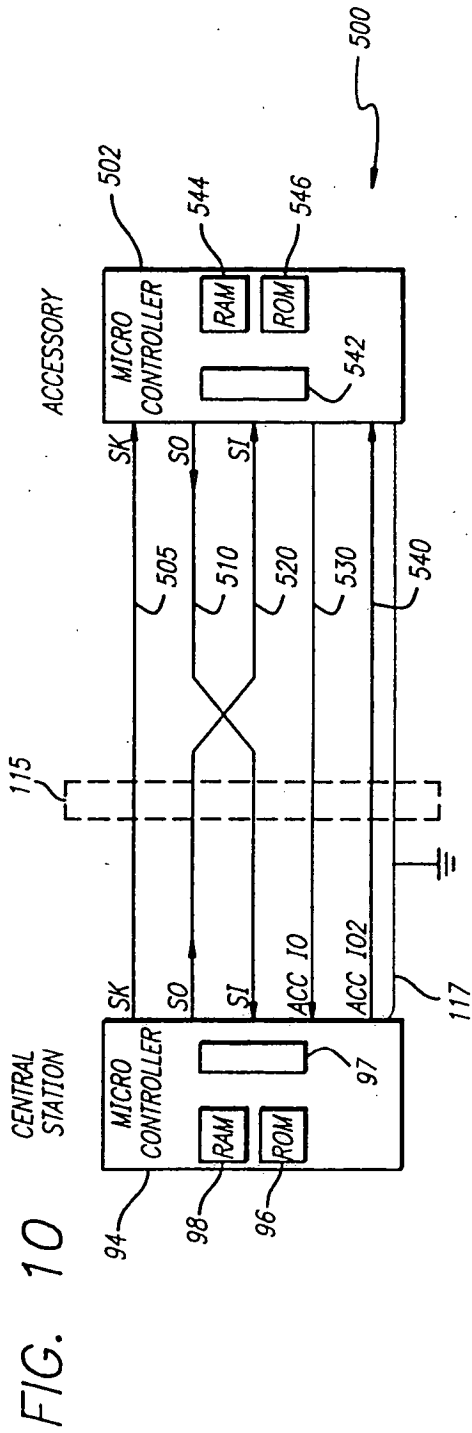


FIG. 9-2





I Claim:

1. In combination with use in a system including a plurality of vehicles each responsive to an individual address and to a plurality of commands for providing individual operations of such vehicles in accordance with such commands,

5 a plurality of pads, each individual one of the pads including a plurality of switches for providing an address to select an individual one of the vehicles and for providing commands to such individual one of the vehicles for operating such individual one of the vehicles in accordance with such commands,

10 a central station responsive to the closure of the switches in each individual one of the pads for sending the address and the commands to the individual one of the vehicles,

there being an additional switch on each individual one of the pads with first and second states of operation, the additional switch in each individual one of the pads providing for the operation of the individual one of the vehicles by only such individual one of the pads and providing in the second state for the operation of the individual one of the vehicles by another one of the pads in addition to the individual one of the pads, and

15 means in the central station for providing for the operation of the vehicle by the individual one of the pads and the additional one of the pads when the additional switch in the individual one of the pads is in the second state.

2. In a combination as set forth in claim 1,

each of the pads including, in the plurality of switches, first switches for controlling the movements of the individual one of the vehicles and including, in the plurality of switches, second switches for controlling other operations of the vehicles than the movements of the vehicles,

5 means responsive in the central station to the operation of the first switches in the individual one of the pads for providing controlled movements of the individual one of the vehicles and responsive in the central station to the operation of the second switches in the

individual one of the pads for providing controlled operations of the individual one of the  
10 vehicles other than the movements of such vehicle.

3. In a combination as set forth in claim 2,

means responsive in the central station to the operation of the additional one of the  
switches in the individual one of the pads in the second state and to the operation of the first  
switches in the individual one of the pads and the additional one of the pads for providing  
5 controlled movements of the individual one of the vehicles and responsive in the central station  
to the operation of the second switches in the individual one of the pads and the additional one  
of the pads for providing controlled operations of the individual one of the vehicles other than  
the movements of such vehicle.

4. In combination in a central station for use with a plurality of pads and a plurality of  
vehicles wherein each of the pads includes a plurality of switches for controlling the operation  
of an individual one of the vehicles,

first means responsive in the central station to the closure of first switches in the plurality  
5 in an individual one of the pads in a pattern for producing first signals providing an address  
identifying an individual one of the vehicles,

second means responsive in the central station to the closure of second switches in the  
plurality in the individual one of the pads for producing second signals providing for an operation  
of the individual one of the vehicles in accordance with such switch closures, and

10 third means responsive in the central station to the closure of a third switch in the  
plurality in the individual one of the pads for providing for an operation of the individual one of  
the vehicles by a second one of the pads simultaneously with the operation of the individual one  
of the vehicles by the individual one of the pads, and

fourth means in the central station for sending to the individual one of the vehicles the  
15 first signals providing the address identifying the individual one of the vehicles and the second  
signals providing commands for obtaining the operation of the vehicle in accordance with the  
pattern of closure of the second switches.



5. In a combination as set forth in claim 4,

the first means being responsive in the central station to the closure of first switches in a second one of the pads in the pattern for producing third signals providing an address identifying the individual one of the vehicles,

5 the second means being responsive in the central station to the closure of second switches in the second one of the pads for producing fourth signals providing for the operation of the individual one of the vehicles in accordance with such switch closures,

10 the fourth means being operative in the central station to send to the individual one of the vehicles from the second one of the pads, simultaneously with the sending to the individual one of the vehicles from the individual one of the pads, the third signals providing the address identifying the individual one of the vehicles and the fourth signals providing commands for obtaining the operation of the vehicle in accordance with the pattern of closure of the second switches in the second one of the pads.

6. In combination for controlling the operation of an individual one of a plurality of vehicles,

5 a handheld pad including a first switch operable in a pattern providing an address of the individual one of the plurality of vehicles and including a plurality of switches individually operable in a pattern providing for operations of the individual one of the vehicles in accordance with the pattern of closures of such switches,

means in the handheld pad for providing a plurality of light indications each for an individual one of the vehicles in the plurality,

10 means in the handheld pad for providing first light indications for the vehicles in the plurality when such handheld pad has not provided an address for any of the vehicles in the plurality, and

means in the handheld pad for providing a second illumination for the individual one of the vehicles when the handheld pad provides the address for such individual one of the vehicles.

7. In a combination as set forth in claim 6,

there being a plurality of handheld pads,

each of the handheld pad including a switch sequentially operative to select successive ones of the vehicles in the plurality, and

5 means responsive in the handheld pad to the sequential operations of the switch for skipping the selection by the handheld pad of a vehicle in the plurality which has previously been addressed by another one of the pads in the plurality.

8. In a combination as set forth in claim 6,  
the first light indications constituting a sequential activation of the light indications in the plurality on a cyclic basis, and

5 means in the handheld pad for discontinuing the sequential activation of the light indications in the handheld pad and for providing a continuous activation of an individual one of the light indications in such pad when such pad is operated to address the vehicle represented by such individual one of the light indications.

9. In combination for operating a vehicle in accordance with addresses and commands provided by a pair of handheld pads and transmitted by a central station to the vehicle,

means in the vehicle for receiving the addresses and commands provided by the pads and transmitted by the central station,

5 means in the vehicle for identifying the received addresses as those of the vehicle,

means responsive in the vehicle to the identification of the addresses received from the pads as those of the vehicle for executing the received commands from the handheld pads when the received commands are complementary, and

10 means responsive in the vehicle to the identification of the received addresses as those of the vehicle for ignoring the received commands from the handheld pads when the received commands are contradictory.

10. In a combination as set forth in claim 9,

means responsive in the vehicle to the discontinuance of one of the pads in the plurality in addressing the vehicle for continuing the response of the vehicle to the addresses and commands from the other one of the pads in the pair.

Applicant: ROKENBOK TOY COMPANY

Packet No.: ROKEN-40907

Atty/Secy: ERR/cm

Serial No.: 08/797,188

Filing Date: February 11, 1997

Title: SYSTEM AND METHOD FOR CONTROLLING THE OPERATION OF TOYS

Inventor(s): PETER C. DeANGELIS

Please acknowledge receipt of the following documents due on July 29, 1999  
sent by First Class Mail on July 7, 1999 by stamping w/PTO stamp and  
returning postcard to addressee.

☒ Transmittal Letter (Duplicate/Triplicate)

☐ Deposit Account No. \_\_\_\_\_ Order (Dupl./Tripl.) JUL 12 1999

☐ Extension of Time

☒ Amendment

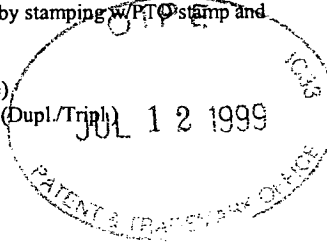
☐ Amendment After Final

☐ Affidavit/Declaration

☐ Issue Fee (PTOL 85b)

☒ Check No. 062233 for \$39.00 for fees relating to the above-referenced

Received  
7/19/99 cm



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PTO/SB/21 (12-87)  
Approved for use through 8/30/00. OMB 0651-0031  
Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

<h1>TRANSMITTAL FORM</h1> <p>(to be used for all correspondence after initial filing)</p>	Application Number	08/797,188
	Filing Date	February 11, 1997
	First Named Inventor	PETER C. DeANGELIS
	Group Art Unit	3712
	Examiner Name	D. Muir
Total Number of Pages in This Submission	Attorney Docket Number	ROKEN-40907

ENCLOSURES (check all that apply)		
<input checked="" type="checkbox"/> Fee Transmittal Form	<input type="checkbox"/> Assignment Papers (for an Application)	<input type="checkbox"/> After Allowance Communication to Group
<input checked="" type="checkbox"/> Fee Attached	<input type="checkbox"/> Drawing(s)	<input type="checkbox"/> Appeal Communication to Board of Appeals and Interferences
<input checked="" type="checkbox"/> Amendment / Response	<input type="checkbox"/> Licensing-related Papers	<input type="checkbox"/> Appeal Communication to Group (Appeal Notice, Brief, Reply Brief)
<input type="checkbox"/> After Final	<input type="checkbox"/> Petition Routing Slip (PTO/SB/69) and Accompanying Petition	<input type="checkbox"/> Proprietary Information
<input type="checkbox"/> Affidavits/declaration(s)	<input type="checkbox"/> To Convert a Provisional Application	<input type="checkbox"/> Status Letter
<input type="checkbox"/> Extension of Time Request	<input type="checkbox"/> Power of Attorney, Revocation Change of Correspondence Address	<input checked="" type="checkbox"/> Additional Enclosure(s) (please identify below):
<input type="checkbox"/> Express Abandonment Request	<input type="checkbox"/> Terminal Disclaimer	Postcard
<input type="checkbox"/> Information Disclosure Statement	<input type="checkbox"/> Small Entity Statement	
<input type="checkbox"/> Certified Copy of Priority Document(s)	<input type="checkbox"/> Request for Refund	
<input type="checkbox"/> Response to Missing Parts/Incomplete Application	Remarks	
<input type="checkbox"/> Response to Missing Parts under 37 CFR 1.52 or 1.53		

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT	
Firm or Individual name	FULWIDER PATTON LEE & UTECHT, LLP ELLSWORTH R. ROSTON, ESQ., REG. NO. 16,310
Signature	<i>Ellsworth R. Roston</i>
Date	July 7, 1999

CERTIFICATE OF MAILING			
I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231 on this date: <u>7-7-99</u>			
Typed or printed name	ELLSWORTH R. ROSTON, ESQ., REG. NO. 16,310		
Signature	<i>Ellsworth R. Roston</i>	Date	July 7, 1999

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<h1 style="text-align: center;">FEE TRANSMITTAL</h1> <h2 style="text-align: center;">for FY 1999</h2> <p style="text-align: center;"><i>Patent fees are subject to annual revision. Small Entity payments must be supported by a small entity statement, otherwise large entity fees must be paid. See Forms PTO/SB/09-12.</i></p>		<i>Complete If Known</i>	
		Application Number	08/797,188
		Filing Date	February 11, 1997
		First Named Inventor	PETER C. DeANGELIS
		Examiner Name	D. Muir
		Group / Art Unit	3712
TOTAL AMOUNT OF PAYMENT (\$)		39.00	Attorney Docket No. ROKEN-40907

METHOD OF PAYMENT (check one)		FEE CALCULATION (continued)																																																																																																																																																																																			
1. <input checked="" type="checkbox"/> The Commissioner is hereby authorized to charge indicated fees and credit any over payments to: Deposit Account Number: 06-2425 Deposit Account Name: FULWIDER PATTON et al. <input checked="" type="checkbox"/> Charge Any Additional Fee Required Under 37 CFR 1.16 and 1.17		3. ADDITIONAL FEES <table border="1"> <thead> <tr> <th>Large Entity Fee Code (\$)</th> <th>Small Entity Fee Code (\$)</th> <th>Fee Description</th> <th>Fee Paid</th> </tr> </thead> <tbody> <tr><td>105</td><td>130</td><td>205</td><td>65</td><td>Surcharge - late filing fee or oath</td><td></td></tr> <tr><td>127</td><td>50</td><td>227</td><td>25</td><td>Surcharge - late provisional filing fee or cover sheet.</td><td></td></tr> <tr><td>139</td><td>130</td><td>139</td><td>130</td><td>Non-English specification</td><td></td></tr> <tr><td>147</td><td>2,520</td><td>147</td><td>2,520</td><td>For filing a request for reexamination</td><td></td></tr> <tr><td>112</td><td>920*</td><td>112</td><td>920*</td><td>Requesting publication of SIR prior to Examiner action</td><td></td></tr> <tr><td>113</td><td>1,840*</td><td>113</td><td>1,840*</td><td>Requesting publication of SIR after Examiner action</td><td></td></tr> <tr><td>115</td><td>110</td><td>215</td><td>55</td><td>Extension for reply within first month</td><td></td></tr> <tr><td>116</td><td>380</td><td>216</td><td>190</td><td>Extension for reply within second month</td><td></td></tr> <tr><td>117</td><td>870</td><td>217</td><td>435</td><td>Extension for reply within third month</td><td></td></tr> <tr><td>118</td><td>1,360</td><td>218</td><td>680</td><td>Extension for reply within fourth month</td><td></td></tr> <tr><td>128</td><td>1,850</td><td>228</td><td>925</td><td>Extension for reply within fifth month</td><td></td></tr> <tr><td>119</td><td>300</td><td>219</td><td>150</td><td>Notice of Appeal</td><td></td></tr> <tr><td>120</td><td>300</td><td>220</td><td>150</td><td>Filing a brief in support of an appeal</td><td></td></tr> <tr><td>121</td><td>260</td><td>221</td><td>130</td><td>Request for oral hearing</td><td></td></tr> <tr><td>138</td><td>1,510</td><td>138</td><td>1,510</td><td>Petition to institute a public use proceeding</td><td></td></tr> <tr><td>140</td><td>110</td><td>240</td><td>55</td><td>Petition to revive - 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SUBMITTED BY		Complete (if applicable)	
Typed or Printed Name	ELLSWORTH R. ROSTON, ESQ.	Reg. Number	16,310
Signature	<i>Ellsworth R. Roston</i>	Deposit Account User ID	06-2425
Date	7-7-99		

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# PATENT APPLICATION FEE DETERMINATION RECORD

Application or Docket Number

08/797,188 (ROKEN-40907)

## CLAIMS AS FILED - PART I

(Column 1)

(Column 2)

SMALL ENTITY

OR

OTHER THAN  
SMALL ENTITY

FOR	NUMBER FILED	NUMBER EXTRA
BASIC FEE (37 CFR 1.16(a))		
TOTAL CLAIMS (37 CFR 1.16(c))	minus 20 = *	
INDEPENDENT CLAIMS (37 CFR 1.16(b))	minus 3 = *	
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(d))		

RATE	FEE
	\$ _____
x \$ _____ =	
x _____ =	
+ _____ =	
TOTAL	

RATE	FEE
	\$ _____
x \$ _____ =	
x _____ =	
+ _____ =	
TOTAL	

\* If the difference in column 1 is less than zero, enter "0" in column 2

## CLAIMS AS AMENDED - PART II

(Column 1)

(Column 2)

(Column 3)

SMALL ENTITY

OR

OTHER THAN  
SMALL ENTITY

AMENDMENT A	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
Total (37 CFR 1.16(c))	* 129	Minus ** 131	= 0
Independent (37 CFR 1.16(b))	* 45	Minus *** 44	= 1
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(d))			

RATE	ADDITIONAL FEE
x \$ _____ =	0
x 39 =	39
+ _____ =	
TOTAL	39
ADDIT. FEE	

RATE	ADDITIONAL FEE
x \$ _____ =	
x _____ =	
+ _____ =	
TOTAL	
ADDIT. FEE	

AMENDMENT B	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
Total (37 CFR 1.16(c))	*	Minus **	=
Independent (37 CFR 1.16(b))	*	Minus ***	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(d))			

RATE	ADDITIONAL FEE
x \$ _____ =	
x _____ =	
+ _____ =	
TOTAL	
ADDIT. FEE	

RATE	ADDITIONAL FEE
x \$ _____ =	
x _____ =	
+ _____ =	
TOTAL	
ADDIT. FEE	

AMENDMENT C	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
Total (37 CFR 1.16(c))	*	Minus **	=
Independent (37 CFR 1.16(b))	*	Minus ***	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(d))			

RATE	ADDITIONAL FEE
x \$ _____ =	
x _____ =	
+ _____ =	
TOTAL	
ADDIT. FEE	

RATE	ADDITIONAL FEE
x \$ _____ =	
x _____ =	
+ _____ =	
TOTAL	
ADDIT. FEE	

- \* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
- \*\* If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
- \*\*\* If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

Burden Hour Statement: This form is estimated to take 0.2 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

<b>PATENT APPLICATION FEE DETERMINATION RECORD</b>	Application or Docket Number <b>ROKEN-40907</b>
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CLAIMS AS FILED - PART I				SMALL ENTITY	OR	OTHER THAN SMALL ENTITY	
FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA		RATE	FEE	RATE	FEE
BASIC FEE (37 CFR 1.16(a))					\$ _____		\$ _____
TOTAL CLAIMS (37 CFR 1.16(c))	151	minus 20 = *	131	x \$ _____ =		x \$ _____ =	
INDEPENDENT CLAIMS (37 CFR 1.16(b))	51	minus 3 = *	48	x _____ =		x _____ =	
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(d))				+ _____ =		+ _____ =	
				TOTAL		TOTAL	

\* If the difference in column 1 is less than zero, enter "0" in column 2

CLAIMS AS AMENDED - PART II					SMALL ENTITY	OR	OTHER THAN SMALL ENTITY	
	(Column 1)	(Column 2)	(Column 3)		RATE	ADDI-TIONAL FEE	RATE	ADDI-TIONAL FEE
AMENDMENT A		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR		PRESENT EXTRA		
	Total (37 CFR 1.16(c))	* 151	Minus	** 151	=	0	x \$ _____ =	
	Independent (37 CFR 1.16(b))	* 51	Minus	*** 51	=	0	x _____ =	
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(d))				+ _____ =		+ _____ =	
					TOTAL		TOTAL	

	(Column 1)	(Column 2)	(Column 3)		RATE	ADDI-TIONAL FEE	RATE	ADDI-TIONAL FEE
AMENDMENT B		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR		PRESENT EXTRA		
	Total (37 CFR 1.16(c))	* 133	Minus	** 151	=	0	x \$ _____ =	
	Independent (37 CFR 1.16(b))	* 45	Minus	*** 51	=	0	x _____ =	
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(d))				+ _____ =		+ _____ =	
					TOTAL		TOTAL	

	(Column 1)	(Column 2)	(Column 3)		RATE	ADDI-TIONAL FEE	RATE	ADDI-TIONAL FEE
AMENDMENT C		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR		PRESENT EXTRA		
	Total (37 CFR 1.16(c))	* 131	Minus	** 133	=	0	x \$ _____ =	
	Independent (37 CFR 1.16(b))	* 44	Minus	*** 45	=	0	x _____ =	
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(d))				+ _____ =		+ _____ =	
					TOTAL		TOTAL	

- \* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
- \*\* If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
- \*\*\* If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
- The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

Burden Hour Statement: This form is estimated to take 0.2 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

PATENT

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20231 on July 7, 1999.

Ellsworth R. Roston  
Ellsworth R. Roston, Reg. No. 16,310

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of	)	Examiner: D. Muir
	)	
PETER C. DeANGELIS	)	Group Art Unit: 3712
	)	
Serial No: 08/797,188	)	Docket No. ROKEN-40907
	)	[#121297/v.3]
	)	
Filed: February 11, 1997	)	Date: July 7, 1999
	)	
For: SYSTEM AND METHOD FOR	)	Los Angeles, California 90024
CONTROLLING THE	)	
OPERATION OF TOYS	)	

AMENDMENT UNDER RULE 116

ASSISTANT COMMISSIONER FOR PATENTS  
Washington, D.C. 20231

Sir:

In response to the Office Action mailed April 29, 1999, please amend the above-  
identified application as follows:



**IN THE CLAIMS:**

Claim 6 (Twice Amended): In combination for controlling the operation of an individual one of a plurality of vehicles,

a first pad included in a plurality of pads and including a first switch operable in a pattern providing an address of the individual one of the plurality of vehicles and including a plurality of switches individually operable in a pattern providing for an operation[s] of the individual one of the vehicles in accordance with the pattern of operation[s] of such switches,

means in the first pad for providing a plurality of light indications each for a particular one of the vehicles in the plurality,

means in the first pad for providing first light indications for the vehicles in the plurality when such first pad has not provided an address for any of the vehicles in the plurality, and

means in the first pad for providing a second illumination for the individual one of the vehicles when the first pad provides the address for such individual one of the vehicles,

the first pad including an additional switch having first and second states of operation and operative in the first state to provide for an operation of the individual one of the vehicles only by the first pad and operative in the second state to provide for an operation of the individual one of the vehicles by [other] another one of the pads in the plurality in addition to the first pad.

Claim 7 (Twice Amended): In a combination as set forth in claim 6,

each of the pads, other than the first pad[s], including a switch corresponding to the first switch in the first pad and sequentially operative to select successive ones of the vehicles in the plurality, and

5 means responsive in each of the pads to the sequential operations of the switch in the pad for skipping the addressing by the pad of a vehicle in the plurality which has already been addressed by another one of the pads in the plurality.

Claim 9 (Twice Amended): In combination for operating a vehicle in accordance with addresses and commands provided by a pair of pads and transmitted by a central station to the vehicle,

means in the vehicle for receiving the addresses and commands provided by the  
5 pads and transmitted by the central station,

means in the vehicle for identifying the addresses received from the pads as those of the vehicle,

means responsive in the vehicle to the identification of the addresses received from the pads as those of the vehicle for executing the received commands from the pads  
10 when the received commands from [the pair of the] pads are complementary, and

means responsive in the vehicle to the identification of the addresses received from [the pair of the] pads as those of the vehicle for ignoring the commands received from the pads when the received commands are contradictory.

Claim 20 (Twice Amended): In combination for use with a central station and a plurality of vehicles for selecting and operating individual ones of the vehicles in accordance with addresses and commands provided by the central station,

a pad in a plurality of pads,

5 a first switch in the pad, the first switch having first and second states and operable on a repetitive basis to the second state for a particular number of times to select an individual one of the vehicles to be addressed by the central station,

10 a plurality of additional switches in the pad, the additional switches having first and second states and operable to the second state in a particular pattern to obtain the operation of the individual one of the vehicles in accordance with the pattern of operation of the additional switches in the second state,

a plurality of light indications in the pad, each of the light indications being associated with a different one of the vehicles in the plurality,

15 means for energizing the light indications in sequence in accordance with the sequential [on a cyclic basis before any] operations of the first switch in the pad to the second state to select the individual one of the vehicles in the plurality,

20 means for continuously energizing the individual one of the light indications associated with the individual one of the vehicles when the first switch in the pad has been operated to the second state on the sequential [repetitive] basis for the particular number of times to select the individual one of the vehicles to be addressed by the central station, and

means for skipping the energizing of the light indications associated with the vehicles addressed by the pads in the plurality other than the pad when the first switch in the other pads is operated on the repetitive basis to address the individual one of the vehicles.

Claim 25 (Twice Amended): In a combination as set forth in claim 23,

the first means being operative to eliminate from interrogation by the central station of any one of the pads disconnected in the plurality from the central station and to provide such elimination at the instant that the pad is disconnected from the central station  
5 and without affecting the interrogation of the other pads by the central station and to provide for the addressing by any of the pads, other than the disconnected pad, of the vehicle previously addressed by the disconnected pad.

Claim 29, line 4, after "plurality" insert ~~only~~.

Claim 43 (Twice Amended): In combination for use in a vehicle for moving the vehicle in accordance with commands which are provided by a pad to control the movements of the vehicle and which are converted by a central station to commands addressed by the central station to the vehicle to obtain the movements of the vehicle,

5 a pair of left wheels in the vehicle, the left wheels being spaced from each other in a longitudinal direction,

a pair of right wheels in the vehicle, the right wheels having the same spacing in the longitudinal direction as the left wheels,

10 a first motor in the vehicle for moving the left wheels in the vehicle in the longitudinal direction,

a second motor in the vehicle for moving the right wheels in the vehicle in the longitudinal direction,

the commands addressed to the vehicle from the central station including first signals for operating the first motor and second signals for operating the second motor,

15 first means in the vehicle for receiving the commands addressed to the vehicle from the central station,

second means responsive in the vehicle to the first and second signals received by the vehicle from the central station for operating the first and second motors in accordance with such signals, [and]

20 the vehicle being operative in a powered and active state and in a powered and inactive state,

third means responsive in the vehicle to the failure of the vehicle in the powered and active state to receive the first and second signals for a particular period of time for maintaining the same operation of the first and second motors for such particular period of time as the operation of the motors upon the last reception by the vehicle of the first and  
25 second signals from the central station[.], and

fourth means operative at the end of the particular time period for converting the operation of the vehicle from a powered and active state to a powered but inactive state when the vehicle fails to receive the first and second signals during the particular time period.

30

Claim 44 (Twice Amended): In a combination as set forth in claim 43,

the particular time period constituting a first particular time period,

[fourth] fifth means responsive in the vehicle to the first and second signals

received by the vehicle from the central station for accelerating the first and second motors

5

in progressive increments to the speeds commanded by the central station to such motors for movement of the vehicle in the longitudinal direction[.],

the vehicle being constructed to be commanded by any one of a plurality of pads each associated with the central station to provide for the addressing by the central station to the vehicle of first and second signals from the pad, and

10

sixth means operative at the end of a second particular time period for converting the operation of the vehicle from the powered but inactive state to a depowered state when the vehicle fails to receive the first and second signals from the central station for any of the pads in the plurality during the second particular time period.

Claim 45 (Twice Amended): In a combination as set first in claim 43,

[fourth] fifth means responsive in the vehicle to the first and second signals received by the vehicle from the central station for operating the first and second motors in accordance with such first and second signals only when the first means [receiver] has received the same first and second signals from the central station a plurality of successive times.

Claim 46 (Twice Amended): In combination

a plurality of pads,

a plurality of vehicles,

each of the pads providing first binary indications representing an address of any individual one of the vehicles and second binary indications representing individual operations to be provided by such vehicle,

a central station responsive to the first and second binary indications from the different pads for producing for each of the pads first signals providing an individual address for the individual one of the vehicles addressed by such pad and second signals providing commands for moving such vehicle in a particular direction and for operating such vehicle,

means responsive in each of the vehicles to the first signals addressing such vehicle from the central station and to the second signals from the central station for such vehicle for moving such vehicle and operating such vehicle in accordance with the commands provided by the central station to such vehicle, [and]

15 means operative in each of the vehicles for continuing to provide a movement of such vehicle for a particular period of time in accordance with the last commands addressed to such vehicle by the central station when the vehicle fails to receive any commands addressed to such vehicle during such particular period of time[.],

20 each of the vehicles being operative in a powered and active state and in a powered but inactive state,

means operative in each of the vehicles for converting the vehicle from the powered and active state to the powered and inactive state at the end of the particular period of time when such vehicle fails to receive any commands addressed to such vehicle during such particular period of time.

Claim 47 (Twice Amended): In a combination as set forth in claim 46,

means in each of the vehicles for providing for a change in [an operation of] such vehicle [in] from the [an] inactive but powered state to a depowered state at the end of [the] a second particular period of time when such vehicle fails to receive any commands addressed to such vehicle from the central station for any of the pads during such second particular period of time.

Claim 54, line 5, after "the" add –successive–.

line 11, before "packets" insert –successive–.



Claim 55, line 17, after "the" add ~~–successive–~~.

line 22, before "packets" insert ~~–successive–~~.

Claim 57, line 13, after "vehicle" delete "on the cyclic basis".

Claim 58 (Twice Amended): In a combination as set forth in claim 57 wherein the successive ones of the second signals are addressed to the vehicle on a cyclic basis and wherein

the third means in each of the vehicles is operative to operate such vehicle in accordance with the second ones of the second signals addressed to such vehicle on the cyclic basis when the second means in such vehicle determines that the successive ones of the second signals addressed to such vehicle on the cyclic basis are identical.

Claim 61 (Twice Amended): In combination in a vehicle for use with a central station operative to receive, from a plurality of pads, first binary indications representing the address of the vehicle and second binary indications representing operations to be performed by the vehicle and for sending first signals in accordance with the first binary indications and second signals in accordance with the second binary indications,

first means in the vehicle for receiving the first and second signals from the central station in representation of the binary indications from each of the pads,

the first and second signals for the vehicle being in the form of packets each having a first particular number of the first signals and a second particular number of the second signals,

second means in the vehicle for determining whether at least a particular percentage of [the] successive packets addressed to the vehicle during a particular period of time has the second particular number of the second signals in such packets, and

third means in the vehicle for operating the vehicle in accordance with the second signals in the packets addressed to such vehicle when the second means in such vehicle determines that at least the particular percentage of the packets addressed to such vehicle during the particular period of time has the second particular number of the second signals in the packets.

Claim 101 (Twice Amended): In combination for use with a plurality of vehicles, a plurality of pads each operative to provide a first plurality of binary indications addressing any individual one of the vehicles and to provide a second plurality of binary indications providing commands to such individual one of the vehicles for operating such vehicle,

a central station,

the pads in the plurality being connected to the central station,

first means in the central station for interrogating the pads to determine the first and second binary indications from such pads,

10                    second means in the pads for transmitting the first and second binary indications  
from the pads to the central station, and

third means responsive in the central station to the identities of the first binary  
indications in successive transmissions of the first and second binary indications from each  
individual one of the pads to the central station for transmitting to the vehicles signals  
15                   representing the first and second binary indications for such pad,

fourth means in the central station for providing a transmittal by the second means  
at each instant only of the second binary indications from the pads which are providing  
changes in address or commands at that instant, [In a combination as set forth in claim 100,  
                     an additional pad being connected to the central station, and

20                   fifth means in the central station for providing for an addressing by the additional  
pad of any of the vehicles not being addressed by the pads in the plurality and for providing  
for a transmission by the third means of the signals representing the first and second binary  
indications for the additional pad to the vehicles in the plurality instantaneously after the  
additional pad is connected to the central station.

                     Claim 102 (Twice Amended): In combination for use with a plurality of vehicles,  
a plurality of pads each operative to provide a first plurality of binary indications  
addressing any individual one of the vehicles and to provide a second plurality of binary  
indications providing commands to such individual one of the vehicles for operating such  
5                   vehicle.

a central station,

the pads in the plurality being connected to the central station,

first means in the central station for interrogating the pads to determine the first and second binary indications from such pads,

10                   second means in the pads for transmitting the first and second binary indications from the pads to the central station, and

third means responsive in the central station to the identities of the first binary indications in successive transmissions of the first and second binary indications from each individual one of the pads to the central station for transmitting to the vehicles signals  
15                   representing the first and second binary indications for such pad,

fourth means in the central station for providing a transmittal by the second means at each instant only of the second binary indications from the pads which are providing changes in address or commands at that instant, [In a combination as set forth in claim 100,]

20                   the first means in the central station being operative to interrogate the pads on a cyclic basis to obtain the binary indications from each of the pads, on the cyclic basis with the other pads, of the individual one of the vehicles addressed by such pad and the binary indications for providing commands for operating the individual one of the vehicles.

Claim 108 (Twice Amended): In combination for use in a system including a plurality of vehicles each responsive to an individual address and to a plurality of commands for providing individual operations of the vehicles in accordance with such commands,

a plurality of pads each operative to provide an address for selecting any  
5 individual one of the vehicles and to provide commands to such individual one of the  
vehicles for operating such individual one of the vehicles in accordance with such  
commands,

a central station, the pads being connected to the central station,

first means in the central station for interrogating the pads to determine the  
10 address and the commands provided by such pads,

second means responsive in the central station to the interrogation provided by the  
first means in the central station concerning the address and the commands from each pad  
for receiving the address and the commands from such pad and for transmitting to the  
vehicles signals representing the address and the commands from such pad, and

15 third means responsive in the central station to any change in the address or  
commands from an individual one of the pads for transmitting the address and the  
commands from such pad to the vehicles in the plurality on a priority basis relative to the  
address and commands from the other pads in the plurality.

Claim 111 (Twice Amended): In combination for use in a system including a  
plurality of vehicles each responsive to an individual address and to a plurality of commands  
for providing individual operations of vehicles in accordance with such commands,

a plurality of pads each operative to provide an address for selecting any  
5 individual one of the vehicles and to provide commands to such individual one of the

vehicles for operating such individual one of the vehicles in accordance with such commands,

a central station, the pads being connected to the central station,

10 first means in the central station for interrogating the pads to determine the address and the commands provided by such pads,

second means responsive in the central station to the interrogation provided by the first means in the central station concerning the address and the commands from such pads for receiving the address and the commands from such pads and for transmitting the address and the commands from such pads to the vehicles in the plurality, and

15 third means responsive in the central station to the connection of an [individual one of the] additional pad[s], other than the pads in the plurality, to the central station and to the reception by the central station of the address and commands from such [individual one of the] additional pad[s] for initially transmitting such address and commands from such [individual one of the] additional pad[s] to the vehicles on a priority basis relative to the  
20 transmission of the address and commands from the [other ones of the] pads in the plurality to the vehicles.]

Claim 113 (Amended): In a combination as set forth in claim 111 wherein

the central station transmits the address and commands from the [individual one of the] additional pad [stations in the plurality] to the vehicles in the plurality only when the central station has completed the transmission to the vehicles in the plurality of the address

5 and commands of the pad in the plurality whose address and commands the central station has been transmitting to the vehicles at the time that the central station receives the address and the commands from the additional pad [individual one of the pads in the plurality].

Claim 128 (Twice Amended): In combination,

a plurality of vehicles each having an individual address,

a plurality of pads each operative to provide an address for selecting any  
individual one of the vehicles and to provide commands to such individual one of the  
5 vehicles for operating such individual one of the vehicles in accordance with such  
commands,

a central station, the pads being connected to the central station,

each of the pads being operative to transmit the address and the commands from  
such pad to the central station for transmission by the central station to the vehicles,

10 each individual one of the vehicles having a light for illumination when such  
vehicle is addressed and commanded by the central station as a result of the address and  
commands from an individual one of the pads,

first means in the central station for storing the addressing by each individual one  
of the pads of the individual one of the vehicles,

15 second means in the central station for communicating a command to the  
individual one of the vehicles to extinguish the light in such vehicle instantaneously after the

individual one of the pads providing the address and the commands to such individual one of the vehicles becomes disconnected from the central station, and

20 third means in each individual one of the vehicles for extinguishing the light in such individual one of the vehicles in accordance with the communication from the central station,

fourth means in the central station for eliminating the storage of the addressing by each individual one of the pads of the individual one of the vehicles instantaneously after such individual one of the pads becomes disconnected from the central station,

25 [In a combination as set forth in claim 127,]

fifth means in the central station for interrogating the pads connected to the central station to determine the address and the commands from such pad to the vehicles,

sixth means for receiving in the vehicles from the central station the address and the commands provided by each of the pads upon the interrogation of such pad by the  
30 central station, and

seventh means in the central station for eliminating one of the pads from the interrogation by the central station, instantaneously after such pad becomes disconnected from the central station, without affecting the interrogation of the other pads by the central station and for providing for the addressing by any of the other pads of the vehicle  
35 previously addressed by the disconnected pad.

Claim 147, line 2, change "vehicles" to -vehicle-.



Claim 156 (Twice Amended): In combination for use with a plurality of vehicles each having an individual address and having members for moving the vehicles,

a central station,

a plurality of pads each operatively connected to the central station and each operative to provide addresses individual to any one of such vehicles and to provide commands for operating such vehicle,

the central station being operative to receive the addresses and commands from the pads and to transmit to the vehicles addresses and commands in packets each composed of a plurality of binary indications representing the address and the commands for an individual one of the vehicles,

means in the central station for transmitting the packets of the binary indications from each of the pads to the vehicles in the plurality,

each of the pads including a switch actuatable a number of times to select any one of the vehicles, the particular number of times being dependent upon the particular one of the vehicles to be addressed by the pad,

memory means in the central station for remembering each of the vehicles addressed at any instant and the pad addressing the vehicle, and

means in the central station for preventing each of the pads from addressing one of the vehicles already being addressed by another one of the pads,

20                   there being a plurality of light illuminable members in each pad, each of the light  
illuminable members being operable, when illuminated, to indicate an individual one of the  
vehicles,  
the preventing means in the central station being operable to prevent each pad  
from illuminating light illuminable members individual to vehicles being addressed by the  
25                   other pads.

**REMARKS**

1. This amendment is being submitted under Rule 116 to place the application in condition for allowance or at least in improved condition for appeal. Accordingly, applicant respectfully requests the Examiner to enter the proposed amendment.

2. Claims 1 - 13, 18 - 30, 32 - 80, 82 - 113, 122 - 128, 146 - 149, 152 - 154, 156 and 158 - 164 have been retained in the application. A number of the claims have been amended to correct informalities noted by applicant's attorney upon a further study of the claims. A number of the claims have been amended to provide a sharp distinction over the references cited by the Examiner. As now written, all of the claims are believed to be definite and to be allowable for certain important reasons over the cited references.

3. Claims 61 , 62, 146 and 147 have been rejected under 35 U.S.C. 1029b) as being anticipated by Rosenhagen. All of these claims are allowable over Rosenhagen for certain important reasons.

Claim 61 is allowable over Rosenhagen for certain important reasons. Rosenhagen does not disclose second means in a vehicle for determining whether at least a particular percentage of successive packets addressed to the vehicle during a particular period of time has a particular number of second signals in the packets. There is also no

disclosure in Rosenhagen of third means in the vehicle for operating the vehicle in accordance with the second signals in the packets addressed to such vehicle when the second means in such vehicle determines that at least the particular percentage of the packets addressed to such vehicle during the particular period of time has the second particular number of the second signals in the packets. Claim 62 is allowable over Rosenhagen for the same reasons as claim 61 since it is dependent from claim 61.

Claim 146 is allowable over Rosenhagen for certain important reasons. For example, claim 146 recites means in the receiving means for providing pulse width modulations for energizing the motors in the vehicle to move the vehicle, the pulse width modulations providing progressive increments of time for energizing the motors to accelerate the vehicle. There is also a recitation in claim 146 of means in the receiving means for progressively energizing the motors with the pulse width modulations for the progressive increments of time to accelerate the motors. These features are not disclosed in Rosenhagen.

Although Rosenhagen recites pulse width modulations, they are produced for a different purpose than what is recited in claim 146. As disclosed by Rosenhagen in column 14, line 60, to page 15, line 7, the pulse width modulations are produced as a result of errors in steering between a desired value and an actual value. The pulse widths of the modulations are variable depending upon the magnitude of the error. If there is no error, a

braking signal is produced in Rosenhagen to prevent any changes in steering. This is not the same as in applicant's system where the width of the pulse width modulations is increased to accelerate the motors for increasing the speed of movement of the vehicle. This is recited in claim 146.

Since claim 147 is dependent from claim 146, it is allowable over Rosenhagen for the same reasons as claim 146. Claim 147 is also allowable over Rosenhagen because it recites that the vehicle is progressively energized with the pulse width modulations for the progressive increments of time from a zero time in the pulse width modulations to accelerate the motors in the vehicle.

4. Claims 23 - 27, 107, 155, 157 and 159 - 161 have been rejected under 35 U.S.C. 1039a) as being unpatentable over Rosenhagen in view of Stern. According to the Examiner at the top of page 3 of the Office Action dated April 29, 1999:

***"Rosenhagen lacks a central station, such as is taught by Stern.***

***It would have been obvious to one of ordinary skill in the art to have provided a Rosenhagen set with a central station, as taught by stern [sic], in order to only require one transmitter, thereby saving on electronic costs."***

When a vehicle in applicant's system fails to receive a command for a particular period of time from a pad addressing the vehicle or when the pad addressing the vehicle in applicant's system addresses another vehicle, the vehicle is released from the addressing pad and is available thereafter to be addressed by any of the pads including the addressing pad. When the vehicle is released from being addressed by the pad addressing the vehicle or when the pad addresses another vehicle, the vehicle does not expend energy. This is different from Rosenhagen. As indicated by Rosenhagen in column 10, lines 24 - 32:

*"If a vehicle fails to receive a properly decodeable command signal in a predetermined period of time, suitably from about 0.5 to about 1.5 seconds, command decoder 18 produces a braking signal which brings toy vehicle 8 to a stop awaiting the receipt of a new command signal. This avoids toy vehicle 8 running away and becoming lost or damaged when the control signal is lost due to distance, malfunction or turning off control set 6."*

Thus, in Rosenhagen, the toy vehicle is still addressed by the control set 6 previously addressing the toy vehicle. This prevents the toy vehicle 8 from being addressed by any of the other control sets. Furthermore, the toy vehicle 8 is expending energy in braking the vehicle.

Stern also cannot address a vehicle such as the vehicle 20 from any one of the control units 26. This results from the fact that the multi-channel FM telemetry oscillator and mixer 38 receives signals representing an operation of a steering control 30 in each individual one of the control units 26. The multi-channel unit 38 converts the operation of the steering control 30 for each control unit 26 into control signals of an individual frequency tuned to an individual one of the vehicles on the track. Thus, each of the control units 26 in Stern can control the operation of only an individual one of the vehicles and cannot control the operation of any of the other vehicles.

In applicant's system, only one central station is provided. This central station transmits signals at the same frequency to all of the vehicles. The signals intended for each vehicle have a different binary address from the signals intended for the other vehicles. The signals are transmitted on a sequential basis by the central station to the different vehicles.

Stern does not provide a single central station. Stern provides a plurality of central stations each operating at an individual frequency to control the operation of an individual one of the vehicles. This may be seen from the discussion by Stern in column 3, lines 46 - 59, where Stern designates the apparatus 38 as a "*multi-channel FM telemetry network*". Stern happens to house the plurality of central stations in a single box 38. But housing the plurality of central stations in a single box 38 does not convert the plurality of central stations into a single central station.

As will be seen from the above discussion, Rosenhagen cannot address a vehicle from any one of a plurality of control pads. Neither can Stern. On this basis, applicant does not see how a person of ordinary skill in the art can combine Rosenhagen and Stern to obtain a system in which any one of a plurality of pads, operating through a single central station, controls the operation of any addressed one of a plurality of vehicles. Furthermore, a person of ordinary skill in the art cannot combine Rosenhagen and Stern to produce a system in which any one of a plurality of pads can control the operation of a vehicle.

Claim 23 recites a plurality of pads each operative to provide an address for selecting any individual one of a plurality of vehicles and to provide commands to such individual one of the vehicles for operating such individual one of the vehicles in accordance with such commands. As described in the immediately preceding paragraphs, neither Rosenhagen nor Stern has a plurality of pads each operative to provide an address for selecting any individual one of a plurality of vehicles.

Claim 23 is also allowable over the combination of Rosenhagen and Stern for several additional and important reasons. Neither Rosenhagen nor Stern discloses a central station. Furthermore, neither Rosenhagen nor Stern discloses first means in the central station for interrogating the pads to determine the address and commands provided by the pads. There is also no disclosure in either Rosenhagen or Stern of second means responsive in the central station to the interrogation by the first means of each pad for sending the



address and commands from the pad to the vehicle addressed by the pad to obtain an operation of such vehicle in accordance with such commands. No disclosure is further provided in either Rosenhagen or Stern that the first means in the central station is operative to interrogate any additional pad connected to the central station at the instant that such additional pad is connected to the central station. Neither Rosenhagen nor Stern additionally discloses that the second means is responsive in the central station to the interrogation provided by the first means in the central station to send signals representing the address and commands from each of the pads in the plurality and the additional pad to the vehicle addressed by such pad, instantaneously after the additional pad is connected to the central station, to obtain an operation of such vehicle in accordance with such commands without affecting the interrogation of the pads in the plurality by the central station.

Claims 24 and 25 are dependent from claim 23 and are accordingly allowable over the combination of Rosenhagen and Stern for the same reasons as claim 23. Claim 24 is additionally allowable over the combination of Rosenhagen and Stern because neither reference discloses third means in the central station for providing for the sending at each instant by the second means of only the commands from the pads which are providing changes in addresses or commands at that instant. Claim 25 recites that the first means is operative to eliminate from interrogation by the central station of any one of the pads disconnected in the plurality from the central station and to provide such elimination at the instant that the pad is disconnected from the central station and without affecting the

interrogation of the other pads by the central station and to provide for the addressing by any of the pads, other than the disconnected pad, of the vehicle previously addressed by the disconnected pad.

Claim 26 is allowable over the combination of Rosenhagen and Stern for substantially the same reasons as discussed above in connection with claim 23. However, claim 26 deals with the disconnection of one of the pads in a plurality from a central station without affecting the interrogation of the other pads in the plurality by the central station. Neither Rosenhagen nor Stern deals with such a situation.

Since claim 27 is dependent from claim 26, it is allowable over the combination of Rosenhagen and Stern for the same reasons as claim 26. Claim 27 is also allowable over the combination of Rosenhagen and Stern because of the recitation of third means in the central station for providing for the transmission at each instant by the second means only of the commands from the pads which are providing changes in addresses or commands at that instant.

Because of its dependency from claim 23, claim 107 is allowable over the combination of Rosenhagen and Stern for the same reasons as claim 23. Claim 107 is also allowable over the combination of Rosenhagen and Stern because Rosenhagen and Stern do

not interrogate the pads. Since they do not interrogate the pads, they cannot interrogate the pads in the plurality and the additional pad simultaneously.

Claim 155 is allowable over the combination of Rosenhagen and Stern for certain important reasons. Neither reference discloses a central station. Furthermore, neither reference discloses a plurality of pads each operatively connected to the central station and each operative to provide addresses individual to any one of such vehicles and to provide commands for operating such vehicle. There is also disclosure in either Rosenhagen or Stern that each of the pads includes a switch actuatable a number of times to select any one of the vehicles, the particular number of times being dependent upon the particular one of the vehicles addressed by the pad. No disclosure is further provided in either of Rosenhagen or Stern of memory means in the central station for remembering each of the vehicles addressed at each instant and the pad addressing the vehicle. Neither of the references further discloses means in the central station for preventing each of the pads from addressing one of the vehicles already being addressed by another one of the pads.

Claim 157 recites a central station. It also recites that each of the pads in a plurality has a first member actuatable a sequential number of times to address any one of the vehicles dependent upon the number of actuations. The claim also recites the interrogation of the pads by the central station to determine the number of actuations of the first member in each of the pads. A recitation is also made in the claim of means in the

central station for remembering each pad and the vehicle selected by the pad and for providing for the transmittal of such information to the pads. There is also a recitation in claim 157 of means responsive in the pads to the remembered information transmitted to the pads from the central station for skipping in each pad the binary indications of vehicles already being addressed by others of the pads when the first member in the pad is actuated the sequential number of times. None of the features specified in this paragraph is disclosed in either Rosenhagen or Stern.

Claim 159 recites that each individual one of the pads in a plurality includes switches for providing an address to select any individual one of a plurality of vehicles. There is also a recitation in the claim of a central station and that the pads are connected to the central station for interrogation simultaneously by the central station concerning the states of operation of the switches in the pads. The claim also recites that the pads sends switch information to the central station in response to the simultaneous interrogation of the pads by the central station. These features are not disclosed in either Rosenhagen or Stern.

Because of their dependency from claim 159, claims 16 and 161 are allowable over the combination of Rosenhagen and Stern for the same reasons as claim 159. Claim 160 is additionally allowable over the combination of Rosenhagen and Stern because neither reference discloses that the first means is responsive to the simultaneous interrogations by the central station of the states of operation of the switches in the pads for transmitting to the

central station the binary indications of the states of closure of the switches. Claim 161 is additionally allowable over the combination of Rosenhagen and Stern because of the recitation that the second means is responsive in the central station to the simultaneous transmission of the binary indications to the central station for transmitting to the vehicles in sequence the signals representing such binary indications.

5. Claims 28, 29, 36 - 39, 43 - 56, 92 - 95, 100, 103, 108 - 110, 122, 123, 126, 127 and 154 have been rejected under 35 U.S.C. (a) as being unpatentable over Yavetz in view of Stern. As will be seen from the discussion below, claims 28, 29, 36 - 39, 43 - 56, 92 - 95, 100, 103, 108 - 110, 122, 123, 126, 127 and 154 are allowable for certain important reasons over the combination of Yavetz and Stern.

As the Examiner has admitted, Yavetz does not disclose a central station. Neither does Stern as discussed in detail in paragraph 4 since Stern discloses a plurality of central stations, each having a different frequency, disposed within a single housing. On this basis, a person of ordinary skill in the art could not combine Yavetz and Stern to provide a system with a central station such as the central station provided by applicant. Except possibly for claims 43 - 45, all of the claims rejected on the combination of Yavetz and Stern recite a central station as a positive element in the claims and further recite the relationship between the central station and a pad or a plurality of pads where each pad operates through the

central station to select any individual one of a plurality of vehicles. This is not disclosed in either Yavetz or Stern.

Applicant filed an Information Disclosure Statement in this application on or about May 7, 1998. The record indicates that the Examiner considered the prior art references in the Information Disclosure Statement on June 30, 1998. One of the prior art references listed in the Information Disclosure Statement is Nakada patent 5,452,401 issued on September 26, 1995. Nakada may be considered to disclose a central station in two (2) of the three (3) embodiments disclosed in his patent. In the embodiment shown in Figure 4, Nakada provides a plurality of passive toy units 1a, 1b, etc., a plurality of transmitters 3a, 3b, etc. and a synchronizing signal transmitting means 5 which may be considered to constitute a central station. The signal transmitting means 5 generates a synchronizing signal for synchronizing the operation of the transmitters 3a, 3b, etc. and actuates a light transmitting element 21 to transmit a synchronizing signal of an infra red beam to the toy units 1a, 1b, etc. Each of the transmitters 3a, 3b, etc. transmits signals to one of the toy units 1a, 1b, etc. in synchronism with one of the synchronizing signals. One of the toy units 1a, 1b, etc. responds to the signal from the energized one of the transmitters 3a, 3b, etc. and the synchronizing signal from the synchronizing means 5.

In the embodiment shown in Figure 5 of Nakada, one (e.g. 3a) of the transmitters 3a, 3b, etc. is provided with a synchronizing signal transmitting means (e.g. the means 5 of

Figure 4). The synchronizing signal transmitting means in this transmitter (e.g. 3a) is connected to the other transmitters (e.g. 3, 3b, etc.). It performs the same functions as the signal transmitting means 5 in the embodiment of Figure 4.

Thus, as late as September, 1995, Nakada provided a central station but not a central station of the type disclosed and claimed by applicant. The central station disclosed by Nakada was not as straight forward or advantageous as that provided by applicant since applicant's central station receives information from the pads and communicates this information directly to the vehicles or accessories. In this way, applicant's central station eliminates many of the duplications which exist in the pads when the pads communicate directly with the vehicles. For example, since applicant's central station provides power to the pads, applicant's central station eliminates the need for providing power from individual power sources to each of the pads.

The Nakada patent issued after Stern and Yavetz. It was not obvious to Nakada, a person skilled in the art, to combine Stern and Yavetz to obtain the advantages of applicant's invention. If it was not obvious to Nakada, a skilled person, to do so, how would it be obvious to a person of ordinary skill in the art to do so?

There is another significant difference between applicant's invention and Nakada. The central station in Nakada does not interrogate the pads to determine the operation of the

switches in the pads and the central station does not transmit to the vehicles signals based upon the interrogation of the pads. This is recited in claims 28, 29, 36 - 39, 46 - 56, 92 - 95, 100, 103, 108 - 110, 122, 123, 126, 127 and 154. These claims are distinguished over each of Yavetz and Stern for the same reasons as discussed in this paragraph as they are distinguished over Nakada.

There are in the prior art a number of references which disclose systems with a multiple number of transmitters and a multiple number of receivers. These include the following in addition to the references cited by applicant in the Information Disclosure Statement filed by applicant in the USPTO:

Hughson patent 3,482,046

Wrege patent 3,639,755

Simonelli patent 4,817,940

The system disclosed in these patents would have benefitted significantly from the inclusion of a central station. The failure of Nakada and the references cited in this paragraph to include a central station of applicant's type in these systems shows that it was not obvious to a person of ordinary skill in the art to provide a central station of the type disclosed and claimed by applicant.



Applicant notes that the Hughson patent issued in 1969. This shows that the unobviousness of a person of ordinary skill in the art to provide a central station of the type disclosed and claimed by applicant has existed for a period of approximately thirty (30) years. In that period, no one has provided a central station of the type disclosed and claimed by applicant. This unobviousness continued into the year 1995 when the Nakada patent issued. Surely the existence of an unobviousness for a period of thirty (30) years negates any argument that the inclusion of a central station of the type disclosed and claimed by applicant would have been obvious to a person of ordinary skill in the art.

Claims 28 and 29 recite a switch operative to provide an address to any individual one of the vehicles dependent upon the number of the operations of the switch in a particular one of the first and second states. The Examiner appears to concede that none of the references including Yavetz and Stern discloses this. The Examiner appears to consider this, on page 3 of the Office Action dated April 29, 1999, *"an obvious choice of design well within the skill of one of ordinary skill in the art"*. The Examiner has cited scores of prior art references including the prior art references cited in the Information Disclosure Statement. None of these references discloses a single switch, such as recited by applicant, for addressing individual ones of a plurality of vehicles. Since none of these references discloses such a single switch, applicant respectfully submits that it would not have been obvious to provide such a switch in a system such as disclosed and claimed by applicant.

In addition to the reasons specified above in this paragraph 5 for the allowability of the claims over the combination of Yavetz and Stern, claims 28, 29, 36 - 39, 46 - 56, 92 - 95, 100, 103, 108 - 110, 122, 123, 126, 127 and 154 are individually allowable over the combination of Yavetz and Stern because neither reference discloses the following:

Claim 28 - There is no disclosure in either reference of means responsive in the central station to the operations in the second state of the second switches providing in a pair of the pads contradictory commands to the individual one of the vehicles for converting such contradictory commands to signals providing specialized commands different from the commands provided by the operation of the different ones of the second switches in such pads.

Claim 29 - Neither reference discloses the features specified above in claim 28. Neither reference further discloses means in the central station for providing at each instant only the commands from the pads which are providing changes in addresses or commands at that instant. There is also no disclosure in either reference of means in the central station for sending to the vehicles in the plurality only the commands provided by the last mentioned means in the central station.

Claim 36 - There is no disclosure in either reference of second means responsive in each vehicle to the same identity of the signals providing the commands in two (2) successive packets addressed to such vehicle by the first means in the central station for operating such vehicle in accordance with the patterns of the signals in such packets.

Claims 37 and 38 - Because of their dependency from claim 36, claims 37 and 38 are allowable over the combination of Yavetz and Stern for the same reasons as claim 36. Furthermore, as described above, claim 37 recites that the central station interrogates the pads. Claim 38 additionally recites means in the central station for transmitting to the vehicles at each instant only the binary indications from the pads which are providing changes in addresses or commands at that instant. These features are not disclosed in either Yavetz or Stern.

Claim 46 - Neither Yavetz nor Stern discloses means operative in each of the vehicles for continuing to provide a movement of such vehicle for a particular period of time in accordance with the last commands addressed to such vehicle by the central station when the vehicle fails to receive any commands addressed to such vehicle during

such particular period of time. Neither reference additionally discloses means operative in each of the vehicles for converting the vehicle from the powered and active state to the powered and inactive state at the end of the particular period of time when such vehicle fails to receive any commands addressed to such vehicle during such particular period of time.

Claim 47 - Claim 47 is allowable over the combination of Yavetz and Stern for the same reasons as claim 46 because of its dependency from claim 46. Claim 47 also recites means in each of the vehicles for providing for a change in such vehicle from the inactive but powered state at the end of a second particular period of time when such vehicle fails to receive any commands addressed to such vehicle from the central station for any of the vehicles during such second particular period of time.

Claim 48 - Claim 48 is allowable over the combination of Yavetz and Stern for the same reasons as claim 46 since it is dependent from claim 46. Claim 48 additionally recites means responsive in each of the vehicles to the commands addressed to the vehicle relating to movements of the vehicle at a particular speed for accelerating the

vehicle in progressive increments to the particular speed. This is not disclosed in either Yavetz or Stern.

Claim 49 - Neither Yavetz nor Stern discloses second means responsive in each of the vehicles to the second and third signals received by the vehicle from the central station for accelerating the first and second motors in progressive increments to the speeds commanded by the central station to such motors for movement of such vehicle in the longitudinal direction.

Claim 50 - Claim 50 is dependent from claim 49 and is accordingly allowable over the combination of Yavetz and Stern for the same reasons as claim 49. Claim 50 also recites third means responsive in each of the vehicles to the second and third signals received by such vehicle from the central station for movement of such vehicle in the longitudinal direction for operating the first and second motors at the same speed, without any progressive increments in speed, when one of the motors in such vehicle has been previously operated at a different speed than the other motor in such vehicle, the same speed constituting the higher of the speeds provided by the first and second motors in such vehicle.

Claim 51 - Since claim 51 is dependent from claim 50, it is allowable over the combination of references for the same reasons as claim 50. Claim 51 additionally recites means operative in each of the vehicles for continuing to operate the first and second motors for a particular period of time in accordance with the last ones of the second and third signals received by such vehicle from the central station when such vehicle fails to receive the second and third signals addressed to such vehicle during such particular period of time.

Claim 52 - Neither Yavetz nor Stern discloses second means responsive in each of the vehicles to the second signals addressed to such vehicle for determining whether successive ones of such vehicle for determining whether successive ones of the second signals addressed to such vehicle are identical and third means in each of the vehicles for operating such vehicle in accordance with the second signals addressed to such vehicle when the second means in such vehicle determines that the successive ones of the second signals addressed to such vehicle are identical.

Claim 53 - Claim 53 is dependent from claim 52 and is accordingly allowable over the combination of Yavetz and Stern for the

same reasons as claim 52. There is an additional recitation in claim 53 that the third means in each of the vehicles is operative to operate such vehicle in accordance with the second signals addressed to such vehicle in the second of the successive ones of the second signals addressed to such vehicle when the second means in such vehicle determines that the successive ones of the second signals addressed to such vehicle are identical. This is not disclosed by either Yavetz or Ster.

Claim 54 - Because of its dependency from claim 52, claim 54 is allowable over the combination of Yavetz and Stern for the same reasons as claim 52. Claim 54 additionally recites fourth means for determining whether at least a particular percentage of the successive packets addressed to each of the vehicles has the first particular number of the first signals and the second particular number of the second signals during a particular period of time. There is also a recitation in claim 54 of fifth means for operating each of the vehicles in accordance with the second signals in the successive packets addressed to such vehicle when the fourth means in such vehicle determines that at least the particular percentage of the packets addressed to such vehicle during the particular period of time has the first particular number of the first signals and the second particular number of the second signals

in the packets.

Claim 55 - A recitation is made in claim 55 of second means for determining whether at least a particular percentage of the packets addressed to each of the vehicles during a particular period of time has the first particular number of the second signals in each packet. There is also a recitation in the claim of third means for operating each of the vehicles in accordance with the second signals in the successive packets addressed to such vehicle when the second means in each vehicle determines that at least the particular percentage of the packets addressed to such vehicle during the particular period of time has the second particular number of the second signals in the packets.

Claim 56 - Since claim 56 is dependent from claim 55, it is allowable over the combination of Yavetz and Stern for the same reasons as claim 55. Furthermore, in addition to the recitation of the interrogation of the pads by the central station, claim 56 recites means in the central station for sending to the vehicles at each instant only the binary indications representing changes in the addresses or commands from the pad at that instant.



Claim 92 - The central station and the pads are constructed to provide for the connection of an additional pad to the central station. The first means in the central station are operative to interrogate the pads in the plurality and the additional pad instantaneously after the connection of the additional pad to the central station. The second means in the pad is operative to transmit the first and second binary indications from the pads in the plurality and the additional pad to the central station instantaneously after the connection of the additional pad to the central station. The third means in the central station is operative to transmit signals representing the first and second binary indications from the pads in the plurality and the additional pad to the vehicles in the plurality instantaneously after the connection of the additional pad to the central station. These features are not disclosed in either Yavetz or Stern.

Claims 93 and 94 - claims 93 and 94 are allowable over the combination of Yavetz and Stern for the same reasons as claim 92 because of their dependency from claim 92. Claim 93 additionally recites that the first means are operative to interrogate the pads in the plurality before the connection of the additional pad to the central station and to interrogate the pads in the plurality and the additional

pad instantaneously after the connection of the additional pad to the central station. Claim 93 additionally recites that the interrogation of the pads is on a cyclic basis. Claim 94 additionally recites that the interrogation of the pads in the plurality is simultaneous before the connection of the additional pad to the central station and that the interrogation of the pads in the plurality and the additional pad is simultaneous after the connection of the additional pad to the central station.

Claim 95 - Since claim 95 is dependent from claim 92, it is allowable over the combination of Yavetz and Stern for the same reasons as claim 92. Claim 95 additionally recites that the fifth means in the central station is operative to continue the illumination of the vehicles addressed by the pads in the plurality and to provide an illumination of the vehicle addressed by the additional pad immediately after the additional pad is connected to the central station.

Claim 100 - There is a recitation in claim 100 of fourth means in the central station for providing a transmittal by the second means at each instant only of the second binary indications from the pads which are providing changes in address or commands at that instant.

Claim 103 - Claim 103 is dependent from claim 100 and is accordingly allowable over the combination of Yavetz and Stern for the same reasons as claim 100. Claim 103 also recites that the first means in the central station is operative to simultaneously interrogate the pads to obtain simultaneously from the pads the first binary indications providing the addresses for the individual ones of the vehicles and the second binary indications providing the commands for operating the individual ones of the vehicles.

Claim 108 - There is no disclosure in either Yavetz or Stern of third means responsive in the central station to any change in the address or commands from an individual one of the pads for transmitting the address and the commands from such pad to the vehicle in the plurality on a priority basis relative to the address and commands from the other pads in the plurality.

Claim 109 - Because of its dependency from claim 108, claim 109 is allowable over the combination of Yavetz and Stern for the same reasons as claim 108. There is also a recitation in claim 109 that the central station discontinues an interrogation of any pad which is disconnected from the central station instantaneously after the pad is

disconnected from the central station. A recitation is also made in claim 109 that the central station provides for the addressing by any of the pads still connected to the central station of the vehicle previously addressed by the disconnected pad.

Claim 110 - Since claim 110 is dependent from claim 108, it is allowable over the combination of Yavetz and Stern for the same reasons as claim 108. Claim 110 additionally recites that the central station transmits the address and commands from the individual one of the pads in the plurality to the vehicles in the vehicles in the plurality only when the central station has completed the transmission to the vehicles in the plurality of the address and commands of the pad whose address and commands the central station has been transmitting at the time that the central station receives the change in the address and the commands from the individual one of the pads in the plurality.

Claim 122 - There is a recitation in claim 122 of fourth means in the central station for transmitting to the vehicles in the plurality only the address and commands transmitted from each pad to the central station that are different from the immediately preceding address or commands transmitted from such pad to the central station.

Claim 123 - Since claim 123 is dependent from claim 122, it is allowable over the combination of Yavetz and Stern for the same reasons as claim 122. An additional recitation is made in claim 123 that the first means in the central station is operative to interrogate the pads simultaneously and that the pads are operative to transmit the addresses and the commands from such pads to the central station when interrogated.

Claim 126 - Neither Yavetz nor Stern discloses that each individual one of the vehicles has a light for illumination when such vehicle is addressed and commanded by the central station as a result of the address and commands from an individual one of the pads. Neither reference additionally discloses first means in the central station for storing the addressing by each individual one of the pads of the individual one of the vehicles. There is also no disclosure in either reference of second means in the central station for communicating a command to the individual one of the vehicles to extinguish the light in such vehicle instantaneously after the individual one of the pads providing the address and the commands to such individual one of the vehicles becomes disconnected from the central station. No disclosure is further provided in either reference of third means in each individual

one of the vehicles for extinguishing the light in such individual one of the vehicles in accordance with the communication from the central station.

According to the Examiner in paragraph 6 of the Office Action, Yavetz provides in each vehicle lights indicating the identity of the vehicle. This is not true. It is true that Yavetz may be considered to provide an illumination of the vehicle. See column 7, lines 7 - 18, of the Yavetz specification. Yavetz provides this illumination in each vehicle every time that the LED 112 in the vehicle is activated by an electromagnetic signal fired by another vehicle to indicate a fire command signal from the controller 12. (Yavetz Abstract lines 13 - 17 and page 7, lines 7 - 37 of the Yavetz specification). However, this illumination in Yavetz does not identify the vehicle. Furthermore, the illumination occurs only at isolated instances and it does not occur when the vehicle is addressed. It would have been desirable in Yavetz to provide a visual indication identifying the vehicle being addressed at each instant, but Yavetz does not do so. Thus, Yavetz does not provide on each vehicle a light for indicating when such vehicle is addressed and commanded.

Yavetz should be considered as a person skilled in the art. The advantage of providing an illumination identifying the addressed vehicle was not obvious to Yavetz even though Yavetz provided at isolated instances another type of illumination in each vehicle. It was not obvious to Stern who would be considered as a person skilled in the art. This would

indicate that it was not obvious to a person of ordinary skill in the art before applicant's invention to provide an illumination identifying the addressed vehicle. Claim 126 is accordingly allowable over the combination of Yavetz and Stern. This is particularly true since neither Yavetz nor Stern discloses a central station and neither Yavetz nor Stern extinguishes the light in a vehicle after the pad addressing the vehicle becomes disconnected from the central station.

Claim 127 - Because of its dependency from claim 126, claim 127 is allowable over the combination of Yavetz and Stern for the same reasons as claim 126. Claim 127 additionally recites fourth means in the central station for eliminating the storage of the addressing by each individual one of the pads of the individual one of the vehicles immediately after such individual one of the pads becomes disconnected from the central station.

Claim 154 - Since claim 154 is dependent from claim 108, it is allowable over the combination of Yavetz and Stern for the same reasons as claim 108. Claim 154 additionally recites that the central station initiates an interrogation of any pad which is connected to the central station, instantaneously after the pad is connected to the central station, to determine if the pad has addressed any one of the vehicles not then being addressed by any of the pads.

As previously indicated, claims 43 - 45 (unlike claims 28, 29, 36 - 39, 46 - 56, 92 - 95, 100, 103, 108 - 110, 122, 123, 126, 127 and 154) do not recite a central station in the body of the claims although the central station is recited in the preamble of the claims. Claims 43 - 45 (unlike claims 28, 29, 36 - 39, 46 - 56, 92 - 95, 100, 103, 108 - 110, 122, 123, 126, 127 and 154) also do not recite the interrogation of pads by the central station to determine the addressing and commands provided by the pads. However, claim 43 is allowable over the combination of Yavetz and Stern because neither reference discloses third means responsive in the vehicle to the failure of the vehicle in the powered and active state to receive the first and second signals for a particular period of time for maintaining the same operation of the first and second motors for such particular time period as the operation of the motors upon the last reception by the vehicle of the first and second signals from the central station. There is also a recitation in claim 43 of fourth means operative at the end of the particular time period for converting the operation of the vehicle from a powered and active state to a powered but inactive state when the vehicle fails to receive the first and second signals during the particular time period. Neither Yavetz nor Stern discloses such fourth means.

Claim 44 - Because of its dependency from claim 43, claim 44 is allowable over the combination of Yavetz and Stern for the same reasons as claim 43. A recitation is also made in claim 44 of fifth means responsive in the vehicle to the first and second signals received by the vehicle from the central station for accelerating the first and second motors



in progressive increments to the speeds commanded by the central station to such motors for movement of the vehicle in the longitudinal direction. There is also a recitation in claim 44 of sixth means operative at the end of a second particular time period for converting the operation of the vehicle from the powered but inactive state to a depowered state when the vehicle fails to receive the first and second signals from the central station for any of the pads in the plurality during the second particular time period.

Claim 45 - Claim 45 is dependent from claim 43 and is accordingly allowable over the combination of Yavetz and Stern for the same reasons as claim 43. Claim 45 also recites fifth means responsive in the vehicle to the first and second signals received by the vehicle from the central station for operating the first and second motors in accordance with such first and second signals only when the first means has received the same first and second signals from the central station a plurality of successive times.

6. Claims 156 and 158 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Rosenhagen in view of Stern as applied to claim 155 and 157 and further in view of Yavetz. Each of claims 156 and 158 is allowable over the combination of Rosenhagen, Stern and Yavetz for certain important reasons.

Claim 156 is allowable over the combination of Rosenhagen, Stern and Yavetz for a number of reasons including the following:

- a. None of the references discloses a central station.
- b. Since none of the references discloses a central station, none of the references discloses that the central station receives addresses and commands from the pads.
- c. None of the references discloses means in the central station for transmitting the packets of the binary indications from each of the pads to the vehicles in the plurality.
- d. There is no disclosure in any of the references that each of the pads includes a switch actuatable a number of times to select any one of the vehicles, the particular number of times being dependent upon the particular one of the vehicles to be addressed by the pad.
- e. No disclosure is provided in any of the references of memory means in the central station for remembering each of the vehicles addressed at any instant and the pad addressing the vehicle.
- f. None of the references discloses means in the central station for preventing each of the pads from addressing one of the vehicles already being addressed by another one of the pads.
- g. There is no disclosure in any of the references that the preventing means in the central station is operable to prevent each pad from illuminating light illuminable members individual to vehicles being addressed by the other pads.

Claim 158 is also allowable over the combination of Rosenhagen, Stern and Yavetz for a number of important reasons. These include the following:

- a. None of the references discloses a central station.

b. None of the references discloses that each of a plurality of pads has a first member actuatable a sequential number of times to address any one of the vehicles dependent upon the number of actuations.

c. No disclosure is provided in the central station of means in the central station for interrogating the pads.

d. There is no disclosure in any of the references of means in the central station for remembering each pad and the vehicle selected by the pad and for providing for the transmittal of such information to the pad.

e. None of the references discloses means responsive in the pads to the remembered information transmitted to the pads from the central station for skipping in each pad the binary indications of vehicles already being addressed by others of the pads when the first member in the pad is actuated the sequential number of times.

f. There is no disclosure in any of the references of means responsive in each pad to the remembered information transmitted to the pad from the central station for skipping the light illuminating members indicating the vehicles already being addressed by others of the pads when the first member in the pad is actuated the sequential number of times to address one of the vehicles.

7. Claims 111 - 113 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Yavetz in view of Stern and Rosenhagen. Claims 111 - 113 are allowable over each of Yavetz, Stern and Rosenhagen for a number of the same reasons.

This prevents Yavetz, Stern and Rosenhagen from being combined to reject claims

111 - 113.

Claim 111 is allowable over the combination of Yavetz, Stern and Rosenhagen for a number of reasons including the following:

- a. None of the references discloses a central station.
- b. There is no disclosure in any of the references of first means in the central station for interrogating the pads to determine the address and the commands provided by the pads.
- c. None of the references discloses second means responsive in the central station to the interrogation provided by the first means in the central station concerning the address and commands from the pads for receiving the address and commands from the pads and for transmitting the address and the commands from the pads to the vehicles in the plurality.
- d. No disclosure is provided in any of the references of third means responsive in the central station to the connection of an additional pad, other than the pads in the plurality, to the central station and to the reception by the central station of the address and commands from such additional pad for initially transmitting such address and commands from such additional pad on a priority basis relative to the transmission of the address and commands from the pads in the plurality.

Since claim 112 is dependent from claim 111, it is allowable over the combination of Yavetz, Stern and Rosenhagen for the same reasons as claim 111. Claim 112 is also allowable over this combination of references because of the failure of any of the references to transmit to the vehicles at each instant only the addresses and commands from the pads which are providing changes in addresses or commands at that instant.

Claim 113 is allowable over the combination of Yavetz, Stern and Rosenhagen for the same reasons as claim 111 because it is dependent from claim 111. Claim 113 is additionally allowable over this combination of references because none of the references discloses that the central station transmits the address and commands from the additional pad to the vehicles in the plurality only when the central station has completed the transmission to the vehicles in the plurality of the address and commands of the pads in the plurality whose address and commands the central station has been transmitting to the vehicles at the time that the central station receives the address and commands from the additional pad.

8. Applicant notes and appreciates the indication by the Examiner that claims 1 - 13, 18 - 22, 30, 32 - 35, 40 - 42, 57 - 60, 63 - 80, 82 - 91, 96 - 99, 104 - 106, 124, 125, 148, 149, 152, 153 and 162 - 164 have been allowed. Applicant also notes and appreciates the indication by the Examiner that claims 101, 102 and 128 would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening

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*PATENT*

claims. Applicant has accordingly rewritten claims 101, 102 and 128 in independent form in accordance with the suggestions of the Examiner and respectfully requests allowance of these claims.

9. Reconsideration and allowance of the application are respectfully requested.

Respectfully submitted,



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11. In combination for use in a system including a plurality of vehicles each responsive to an individual address and to a plurality of commands for providing individual operations of such vehicle in accordance with such commands,

5 a plurality of pads each operative to provide an address for selecting an individual one of the vehicles and to provide commands to such individual one of the vehicles for operating such individual one of the vehicles in accordance with such commands,

a central station responsive to the address and the commands from each of the pads for sending the address and the commands from such pad to the vehicle selected by such pad to obtain an operation of such vehicle in accordance with such commands, and

10 means in the central station for obtaining the interrogation at each instant of only the pads in the plurality that are providing addresses and commands to obtain the operation of vehicles in the plurality.

12. In a combination as set forth in claim 11,

means in the central station for transmitting the addresses and commands from the interrogated pads to the vehicles in the plurality to obtain the operation, in accordance with such commands, of the vehicles addressed by the central station on the cyclic basis.

13. In a combination as set forth in claim 12,

each of the pads including a switch having first and second states of operation and operative in the first state to provide an operation of an individual one of the vehicles in the plurality only by such pad and operative in the second state to provide for the operation of such  
5 individual one of the vehicles simultaneously by such pad and another one of the pads.

14. In combination,

a plurality of operative members,

a plurality of pads, each individual one of the pads including first and second pluralities of switches each having first and second operative relationships, the first switches having the



5 second operative relationship in a pattern providing an address to select an individual one of the  
operative members and the second switches having the second  
operative relationship in a pattern providing for a controlled operation of the individual one of  
the operative members,

10 a central station having first and second states of operation, the central station being  
responsive in the first state of operation of the central station to the individual pattern of the first  
switches in the second state of operation of the first switches for producing a plurality of signals  
representing the address of the individual one of the vehicles and being responsive in the first  
state of operation to the individual pattern of the second switches in the second state of operation  
of the second switches for producing a second plurality of signals providing a first controlled  
15 operation of the individual one of the operative members,

the central station being responsive in the second state of operation of the central station  
to the individual pattern of the second switches in the second state of operation of the second  
switches for producing a third plurality of signals for providing a second controlled operation of  
the individual one of the operative members different from the first controlled operation of the  
20 individual one of the operative members.

15. In a combination as set forth in claim 14,

means for sending to the operative members the first and second pluralities of signals in  
the first state of operation of the central station and the first and third pluralities of signals in the  
second state of operation of the central station.

16. In combination,

a plurality of vehicles,

a plurality of pads, each individual one of the pads including a plurality of switches  
having open and closed states of operation for providing an address to select an individual one  
5 of the vehicles and for providing commands to such individual one of the vehicles for operating  
such individual one of the vehicles in accordance with such commands,

a central station responsive to the closure of the switches in each individual one of the pads for sending the commands to the individual one of the vehicles addressed by such individual one of the pads,

10 means in the vehicles for powering the vehicles to perform the commands sent to the vehicles by the central station,

means in the central station for determining in each progressive particular period of time whether any of the pads has provided addresses and commands to any of the vehicles, and

15 means in the central station for providing commands to the vehicles to depower the vehicles when the central station has determined that none of the pads has provided addresses and commands to any of the vehicles in one of the progressive particular periods of time.

17. In a combination as set forth in claim 16,

means responsive in the vehicles to the addresses and commands from the central station for performing the commands addressed to such vehicles by the central station, and

5 means responsive in the vehicles to the depowering commands from the central station for depowering such vehicles.

18. In combination,

a plurality of vehicles,

5 a plurality of pads, each individual one of the pads including a plurality of switches having open and closed states for providing an address to select an individual one of the vehicles and for providing commands to such individual one of the vehicles for operating such individual one of the vehicles in accordance with such commands,

a central station responsive to the closure of the switches in such individual one of the pads for sending the commands to the individual one of the vehicles addressed by such individual one of the pads,

10 first means including a memory in the central station for storing in the memory the identity of the individual one of the vehicles last addressed by such individual one of the pads, and

second means in the central station for providing for the selection again by such individual one of the pads of the individual one of the vehicles stored in the memory for such individual one of the pads after such individual one of the pads has selected one of the vehicles other than the individual one of the vehicles or after the individual one of the pads has failed to provide a command to the individual one of the vehicles for a particular period of time.

19. In a combination as set forth in claim 18,

each of the pads including a switch having open and closed states and operable to the closed state on a repetitive basis for a particular number of times to select the individual one of the vehicles, each of the pads including additional switches having open and closed states and operable to the closed state to provide the commands for operating the individual one of the vehicles, and

the second means in the central station being responsive to the operation of any of the additional switches to the closed state, after such individual one of the pads has selected one of the vehicles other than the individual one of the vehicles or after the individual one of the pads has failed to provide a command to the individual one of the vehicles for a particular period of time, for providing for the selection again by such individual one of the pads of such individual one of the vehicles.

20. In combination for use with a central station and a plurality of vehicles for selecting and operating individual ones of the vehicles in accordance with addresses and commands provided by the central station,

a hand held pad,

a first switch in the pad, the first switch having open and closed states and operable on a repetitive basis to the closed state for a particular number of times to select an individual one of the vehicles to be addressed by the central station,

a plurality of additional switches in the pad, the additional switches having open and closed states and being operable to the closed state in a particular pattern to obtain the operation of the individual one of the vehicles in accordance with the pattern of closure of the additional switches,

a plurality of light indications in the pad, each of the light indications being associated with a different one of the vehicles in the plurality,

15 means for energizing the light indications in sequence on a cyclic basis before any closures of the first switch to select the individual one of the vehicles in the plurality, and

means for continuously energizing the individual one of the light indications associated with the individual one of the vehicles when the first switch in the pad has been operated to the closed state on the repetitive basis for the particular number of times to select the individual one of the vehicles to be addressed by the central station.

21. In a combination as set forth in claim 20,

the pad constituting a first pad,

there being a plurality of additional pads each having the same construction as the first pad, and

5 means for skipping the light indications in the first pad of the vehicles selected by the additional pads when the first switch in the first pad is operated to the closed state on the repetitive basis.

22. In a combination as set forth in claim 20,

means for sending to the central station a first plurality of binary indications representing the repetitive operation of the first switch in the pad to the closed state to provide an address by the central station for the individual one of the vehicles in the plurality and a second plurality of  
5 binary indications representing the pattern of closure of the additional switches in the pad to provide the commands by the central station for operating the individual one of the vehicles.

23. In combination for use in a system including a plurality of vehicles each responsive to an individual address and to a plurality of commands for providing individual operations of vehicles in accordance with such commands,

a plurality of pads each operative to provide an address for selecting an individual one  
5 of the vehicles and to provide commands to such individual one of the vehicles for operating such individual one of the vehicles in accordance with such commands,

a central station connected to the pads,

first means in the central station for interrogating the pads to determine the address and the commands provided by such pads,

10        second means responsive in the central station to the interrogation provided by the first means in the central station concerning the address and the commands from each pad for sending the address and the commands from such pad to the vehicle addressed by such pad to obtain an operation of such vehicle in accordance with such commands,

15        the first means in the central station being operative to interrogate any additional pad connected to the central station, and

20        the second means being responsive in the central station to the interrogation provided on the cyclic basis by the first means in the central station concerning the address and the commands from the pads in the plurality and from the additional pad for sending signals representing the address and the commands from each such pad to the vehicle addressed by such pad to obtain an operation of such vehicle in accordance with such commands.

24. In a combination as set forth in claim 23,

third means in the central station for transmitting at each instant only the commands from the pads which are providing changes in commands at that instant.

25. In a combination as set forth in claim 23,

the first means being operative to eliminate any of the pads disconnected in the plurality from the central station.

26. In combination for use in a system including a plurality of vehicles each responsive to an individual address and to a plurality of commands for providing individual operations of vehicles in accordance with such commands,

5 a plurality of pads each operative to provide an address for selecting an individual one of the vehicles and to provide commands to such individual one of the vehicles for operating such individual one of the vehicles in accordance with such commands,

a central station connected to the pads,

first means in the central station for interrogating the pads to determine the address and the commands provided by such pads,

10 second means responsive in the central station to the interrogation provided by the first means in the central station concerning the address and the commands from each pad for sending signals representing the address and the commands from such pad to the vehicle addressed by such pad to obtain an operation of such vehicle in accordance with such commands,

15 the first means in the central station being operative to eliminate, from the interrogation any of the pads disconnected in the plurality from the central station,

20 the second means being responsive in the central station to the interrogation provided by the first means in the central station concerning the address and the commands from the pads interrogated by the central station for sending the signals representing the address and the commands from each such pad to the vehicle addressed by such pad to obtain an operation of such vehicle in accordance with such commands.

27. In a combination as set forth in claim 26,

third means in the central station for transmitting at each instant only the commands from the pads which are providing changes in commands at that instant.

28. In combination for use in a system including a plurality of vehicles each responsive to an individual address and to a plurality of commands for providing individual operations of vehicles in accordance with such commands,

5 a plurality of pads each including a first switch having open and closed states and operative to provide an address to an individual one of the vehicles dependent upon the number of such switch closures and including a plurality of switches each having open and closed states and operative in the closed state to provide a particular operation of the individual one of the vehicles,

10 a central station responsive to the closures of the first switch in each of the pads for providing an address to an individual one of the vehicles dependent upon the number of such switch closures in such pad and responsive to the closures of the second switches in such pad for providing signals representing operations to be performed by such individual one of the vehicles, and

15 means responsive in the central station to the closures of individual pairs of the second switches providing in each of the pads contradictory commands to the individual one of the vehicles for converting such contradictory commands to signals providing specialized commands different from the commands provided by the closure of the different ones of the second switches in such pad.

29. In a combination as set forth in claim 28,

means in the central station for providing at each instant only the commands from the pads which are providing changes in commands at that instant, and

5 means in the central station for sending the vehicles in the plurality the commands provided by the last mentioned means in the central station.

30. In combination for use with a plurality of hand held pads each manually operable to provide signals representing addresses and commands,

5 a central station responsive to the addresses and commands from the hand held pads for providing for each of the pads a first plurality of signals representing the address of an individual one of the vehicles and a second plurality of signals representing the commands for operating such individual one of the vehicles, the first and second pluralities of signals provided at the central station for each of the pads occurring at a particular rate selected in a particular range of rates,

the central station also providing a plurality of start signals at the particular rate,

10 a plurality of vehicles each having an individual address and each including first means responsive to the signals representing the individual address for such vehicle and responsive to the second signals providing the commands for such vehicle for operating such vehicle in accordance with such commands, and

15 means responsive in the vehicle to the start signals from the central station for determining the particular rate of occurrence of the start signals and for providing for the response of the first means in the vehicle, at the particular rate of occurrence of the start signals, to the signals representing the individual address of each vehicle and to the second signals providing the commands for such vehicle.

31. In a combination as set forth in claim 30,

the central station including a smart port operable on the first and second signals for each pad for modifying such signals to produce, for the vehicle individual to each of the pads, commands different from the commands represented by the second signals for such pad.

32. In a combination as set forth in claim 30,

the central station being operative in a first mode to provide for the addressing of each individual one of the vehicles by only one of the pads in the plurality and being operative in a second mode to provide for the addressing of  
5 each individual one of the vehicles by two (2) of the pads in the plurality.

33. In combination,

a plurality of vehicles,

a plurality of hand held pads each including a first switch having open and closed states and operable in the closed state to select an individual one of the vehicles dependent upon the  
5 number of closures of the first switch and each including a plurality of second switches each having open and closed states, the second switches for each of the pads being operable in the closed state in a pattern providing an operation of the selected vehicle dependent upon such switch closures,

a central station,

10 first means in the central station for interrogating the pads in the plurality to determine the number of closures of the first switch and the pattern of closures of the second switches for each of the pads,



second means in the central station for providing, for each of the pads, a first plurality of signals providing an address dependent upon the number of closures of the first switch in such pad and a second plurality of signals providing commands dependent upon the pattern of closure of the second switches in such pad, the first and second signals for each of the pads occurring at a particular rate,

third means in the central station for providing a plurality of start signals at the particular rate,

fourth means responsive in each of the vehicles to the start signals at the particular rate for operating upon the first plurality of signals in each of the pads at the particular rate to identify the address individual to such vehicle and for operating upon the second plurality of signals at the particular rate to identify the commands related to the address individual to such vehicle, and

fifth means for operating each vehicle in accordance with the commands provided for such vehicle.

34. In a combination as set forth in claim 33,

sixth means associated in the central station with the fifth means for transmitting to the vehicles at each instant only the signals representing changes in commands from the pads at that instant.

35. In a combination as set forth in claim 33,

each of the pads including an additional switch having first and second states of operation and providing in the first state of operation for the addressing by such pad of one of the vehicles not addressed at that time by any of the other pads and providing in the second state of operation for the addressing of one of the vehicles addressed at that time by another one of the pads.

36. In combination for use with a plurality of vehicles,

a plurality of pads each operative to identify an individual one of the vehicles addressed by such pad and to provide a plurality of binary indications providing commands for operating the individual one of the vehicles identified by such address,

a central station,

first means operatively coupled in the central station to the pads in the plurality for providing packets of signals identifying for each pad the individual one of the vehicles addressed by such pad and the commands for operating the individual one of the vehicles, and

10 second means responsive in each vehicle to the same identity of the signals providing the commands in two (2) successive packets addressed to such vehicle for operating such vehicle in accordance with the pattern of the signals in such packets.

37. In a combination as set forth in claim 36,

means in the central station for interrogating the pads on a cyclic basis to obtain binary indications from each of the pads, on the cyclic basis with the other pads, of the individual one of the vehicles addressed by such pad and the binary indications providing commands for  
5 operating the individual one of the vehicles.

38. In a combination as set forth in claim 36,

means in the central station for transmitting at each instant only the binary indications from the pads which are providing changes in addresses or commands at that instant.

39. In a combination as set forth in claim 38,

means in the central station for simultaneously interrogating the pads to obtain simultaneous binary indications from the pads of the individual ones of the vehicles addressed by such pads and the binary indications providing the commands for operating the individual  
5 ones of the vehicles.

40. In combination in a vehicle for moving the vehicle in accordance with commands which are provided by a handheld pad to control the movements of the vehicle and which are converted by a central station to commands addressed by the central station to the vehicle to obtain the movements of the vehicle,

5 a pair of left wheels in the vehicle, the left wheels being spaced from each other in a longitudinal direction,

a pair of right wheels in the vehicle, the right wheels having the same spacing in the vehicle in the longitudinal direction as the left wheels,

first means in the vehicle for receiving the commands addressed to the vehicle from the  
10 central station,

a first motor in the vehicle for moving the left wheels in the vehicle in the longitudinal  
direction,

a second motor in the vehicle for moving the right wheels in the vehicle in the  
longitudinal direction,

15 the commands addressed to the vehicle from the central station including first signals for  
operating the first motor and second signals for operating the second motor,

second means responsive in the vehicle to the first and second signals received by the  
vehicle from the central station for normally accelerating the first and second motors in  
progressive increments to the speeds commanded by the central station to such motors for  
20 movement of the vehicle in the longitudinal direction, and

third means responsive in the vehicle to the first and second signals received by the  
vehicle from the central station for operating the first and second motors at the same speed  
without any progressive increments in speed, for movement of the vehicle in the longitudinal  
direction, when one of the motors has been previously operated at a different  
25 speed than the other motor, the same speed constituting the higher of the speeds provided by the  
first and second motors.

41. In a combination as recited in claim 40,

fourth means responsive in the vehicle to the first and second signals received by the  
vehicle from the central station for converting the first and second signals to pulse width  
modulations in progressive periods of time, the pulse width modulations for each of the first and  
5 second motors at each instant being dependent upon the speed at which such motor is to be  
operated at that instant,

the operation of the second and third means at each instant being dependent upon such  
pulse width modulations at that instant and the duty cycles of such pulse width modulations at  
that instant.

42. In a combination as set forth in claim 40,

fourth means responsive in the vehicle to the failure of the vehicle to receive the first and second signals for a particular period of time for maintaining the same operation of the first and second motors for such particular period of time as the operation of such motors upon the last reception by the vehicle of the first and second signals from the central station.

43. In combination in a vehicle for moving the vehicle in accordance with commands which are provided by a handheld pad to control the movements of the vehicle and which are converted by a central station to commands addressed by the central station to the vehicle to obtain the movements of the vehicle,

a pair of left wheels in the vehicle, the left wheels being spaced from each other in a longitudinal direction,

a pair of right wheels in the vehicle, the right wheels having the same spacing in the longitudinal direction as the left wheels,

a first motor in the vehicle for moving the left wheels in the vehicle in the longitudinal direction,

a second motor in the vehicle for moving the right wheels in the vehicle in the longitudinal direction,

the commands addressed to the vehicle from the central station including first signals for operating the first motor and second signals for operating the second motor,

first means in the vehicle for receiving the commands addressed to the vehicle from the central station,

second means responsive in the vehicle to the first and second signals received by the vehicle from the central station for operating the first and second motors in accordance with such signals, and

third means responsive in the vehicle to the failure of the vehicle to receive the first and second signals for a particular period of time for maintaining the same operation of the first and second motors for such particular period of time as the operation of the motors upon the last reception by the vehicle of the first and second signals from the central station.

44. In a combination as set forth in Exhibit 43,

fourth means responsive in the vehicle to the first and second signals received by the vehicle from the central station for normally accelerating the first and second motors in progressive increments to the speeds commanded by the central station to such motors for movement of the vehicle in the longitudinal direction.

45. In a combination as set first in Exhibit 43,

fourth means responsive in the vehicle to the first and second signals received by the vehicle from the central station for operating the motor in accordance with such first and second signals only when the receiver has received the same first and second signals from the central station a plurality of successive times.

46. In combination,

a plurality of hand held pads,  
a plurality of vehicles,

each of the handheld pads providing first binary indications representing a selection of an individual one of the vehicles and second binary indications representing individual operations to be provided by such vehicle,

a central station responsive to the first and second binary indications from the different pads on a cyclic basis for producing for each of the pads first signals providing an individual address for the individual one of the vehicles selected by such pad and second signals providing commands for moving such vehicle in a particular direction and for operating such vehicle,

means responsive in each of the vehicles to the first signals addressing such vehicle from the central station and to the second signals from the central station for such vehicle for moving such vehicle and operating such vehicle in accordance with the commands provided by the central station to such vehicle, and

means operative in each of the vehicles for continuing to provide a movement of such vehicle for a particular period of time in accordance with the last commands addressed to such vehicle by the central station when the vehicle fails to receive any commands addressed to such vehicle during such particular period of time.

47. In a combination as set forth in claim 46,

means in each of the vehicles for providing for an operation of such vehicle in the inactive but powered state at the end of the particular period of time when such vehicle fails to receive any commands addressed to such vehicle during such particular period of time.

48. In a combination as set forth in claim 46,  
means responsive in each of the vehicles to the commands addressed to the vehicle relating to movements of the vehicle for accelerating the vehicle in progressive increments to obtain such movements.

49. In combination,  
a plurality of hand held pads,  
a plurality of vehicles,  
each of the handheld pads providing first binary indications representing a selection of  
5 an individual one of the vehicles and second binary indications representing individual operations to be provided by such vehicle,

a central station responsive to the first and second binary indications from the different pads on a cyclic basis for producing for each of the pads first signals providing an individual address for the individual one of the vehicles selected by such pad,

10 each of the vehicles including a pair of left wheels spaced from each other in a longitudinal direction and a pair of right wheels spaced from each other in the longitudinal direction and including a first motor for moving the left wheels and a second motor for moving the right wheels,

the commands addressed to the vehicle from the central station including second signals  
15 for operating the first motor and third signals for operating the second motor,

first means in each of the vehicles for receiving the first, second and third signals addressed to such vehicle from the central station,

second means responsive in each of the vehicles to the second and third signals received by the vehicle from the central station for normally accelerating the first and second motors in  
20 progressive increments to the speeds commanded by the central station to such motors for movement of such vehicle in the longitudinal direction.

50. In a combination as recited in claim 49,

third means responsive in each of the vehicles to the second and third signals received by such vehicle from the central station for movement of such vehicle in the longitudinal

direction for operating the first and second motors at the same speed, without any progressive  
5 increments in speed, when one of the motors in such vehicle has been previously operated at a  
different speed than the other motor in such vehicle, the same speed constituting the higher of  
the speeds provided by the first and second motors in such vehicle.

51. In a combination as set forth in claim 49,

means operative in each of the vehicles for continuing to operate the first and second  
motors for a particular period of time in accordance with the last ones of the second and third  
signals received by such vehicle from the central station when such vehicle fails to receive the  
5 second and third signals addressed to such vehicle during such particular period of time.

52. In combination,

a plurality of hand held pads,

a plurality of vehicles,

each of the hand held pads providing first binary indications representing a selection of  
5 an individual one of the vehicles and second binary indications representing individual  
operations to be provided by such vehicles,

a central station responsive to the first and second binary indications from the different  
pads on a cyclic basis for producing for each of the pads first signals providing an individual  
address for the individual one of the vehicles selected by such pad and second signals providing  
10 commands for moving such vehicle in a particular direction and for operating such vehicle,

first means in each of the vehicles for receiving the first and second signals from each of  
the pads,

second means responsive in each of the vehicles to the second signals addressed to such  
vehicle for determining whether successive ones of the second signals addressed to such vehicle  
15 on the cyclic basis are identical, and

third means in each of the vehicles for operating such vehicle in accordance with the  
second signals addressed to such vehicle when the second means in such vehicle determines that  
the successive ones of the second signals addressed to such vehicle on the cyclic basis are  
identical.



53. In a combination as set forth in claim 52,

the third means in each of the vehicles being operative to operate such vehicle in accordance with the second signals addressed to such vehicle in the second of the successive ones of the second signals addressed to such vehicle on the cyclic basis when the second means in such vehicle determines that the successive ones of the second signals addressed to such vehicle on the cyclic basis are identical.

54. In a combination as set forth in claim 52,

the first and second signals for each of the vehicles being in the form of packets each having a first particular number of the first signals and a second particular number of the second signals,

fourth means for determining whether at least a particular percentage of the packets addressed to each of the vehicles has the first particular number of the first signals and the second particular number of the second signals in such packets during a particular period of time, and

fifth means for operating each of the vehicles in accordance with the second signals in the packets addressed to such vehicle when the fourth means in such vehicle determines that at least the particular percentage of the packets addressed to such vehicle has the first particular number of the first signals and the second particular number of the second signals in the packets during the particular period of time.

55. In combination,

a plurality of hand held pads,

a plurality of vehicles,

each of the hand held pads providing first binary indications representing a selection of an individual one of the vehicles and second binary indications representing individual operations to be provided by such vehicles,

a central station responsive to the first and second binary indications from the different pads on a cyclic basis for producing for each of the pads on the cyclic basis first signals providing an individual address for the individual one of the vehicles selected by such pad and

10 second signals providing commands for moving such vehicle in a particular direction and for operating such vehicle,

first means in each of the vehicles for receiving the first and second signals from each of the pads,

15 the first and second signals for each of the vehicles being in the form of packets each having a first particular number of the first signals and a second particular member of the second signals,

second means for determining whether at least a particular percentage of the packets addressed to each of the vehicles has the first particular number of the second signals in each packet during a particular period of time, and

20 third means for operating each of the vehicles in accordance with the second signals in the packets addressed to such vehicle when the fourth means in each vehicle determines that at least the particular percentage of the packets addressed to such vehicle has the second particular number of the second signals in the packets during the particular period of time.

56. In a combination as set forth in claim 55,

the central station being operative to interrogate each of the pads on the cyclic basis to determine the first and second binary indications from such pads, and

5 means in the central station for sending to the vehicles at each instant only the second binary indications representing changes in the commands from the pads at that instant.

57. In combination in a vehicle for use in a central station operative to receive, from a plurality of pads on a cyclic basis, first binary indications representing the address of the vehicle and second binary indications representing operations to be performed by the vehicle and operative to send first signals in accordance with the first binary indications and second signals  
5 in accordance with the second binary indications,

first means in the vehicle for receiving the first and second signals from the central station on the cyclic basis for each of the pads,

second means in the vehicle for determining whether successive ones of the second signals addressed to such vehicle on the cyclic basis are identical, and

10        third means in each of the vehicles for operating such vehicle in accordance with the second signals addressed to such vehicle when the second means in such vehicle determines that the successive ones of the second signals addressed to such vehicle on the cyclic basis are identical.

58. In a combination as set forth in claim 57 wherein

the third means in each of the vehicles is operative to operate such vehicle in accordance with the successive ones of the second signals addressed to such vehicle on the cyclic basis when the second means in such vehicle determines that the successive ones of the second signals  
5        addressed to such vehicle on the cyclic basis are identical.

59. In a combination as set forth in claim 58, including,

fourth means responsive to first ones of the second signals addressed to such vehicle on the cyclic basis for moving the vehicle, and

fifth means responsive to second ones of the second signals addressed to such vehicle on  
5        the cyclic basis for providing operations of the vehicle other than moving the vehicle.

60. In a combination as set forth in claim 59,

the first and second signals for the vehicle being in the form of packets each having a first particular number of the first signals and a second particular number of the second signals,

sixth means for determining whether at least a particular percentage of the packets  
5        addressed to the vehicle has the second particular number of the second signals in such packets during a particular period of time, and

seventh means for operating the vehicle in accordance with the second signals in the packets addressed to such vehicle when the sixth means in such vehicle determines that at least the particular percentage of the packets addressed to such vehicle has at least the second  
10        particular number of the second signals in the packet, during the particular period of time.

61. In combination in a vehicle for use with a central station operative to receive, from a plurality of pads on a cyclic basis, first binary indications representing the address of the vehicle and second binary indications representing operations to be performed by the vehicle and for sending first signals in accordance with the first binary indications and second signals in accordance with the second binary indications,

first means in the vehicle for receiving the first and second signals from the central station in representation of the binary indication from each of the pads,

the first and second signals for the vehicle being in the form of packets each having a first particular number of the first signals and a second particular number of the second signals,

second means in the vehicle for determining whether at least a particular percentage of the packets addressed to the vehicle has the second particular number of the second signals in such packets during a particular period of time, and

third means in the vehicle for operating the vehicle in accordance with the second signals in the packets addressed to such vehicle when the second means in such vehicle determines that at least the particular percentage of the packets addressed to such vehicle has the second particular number of the second signals in the packets during the particular period of time.

62. In a combination as set forth in claim 61,

the vehicle including wheels and motors for rotating the wheels and including at least one member movable on the vehicle to perform selective functions,

the third means being responsive in the vehicle to the second signals for rotating the wheels in the vehicle to obtain a movement of the vehicle in accordance with such wheel rotations and for moving the member to perform the selective functions.

63. In combination for use in a system including a central station and a plurality of vehicles and a plurality of pads each manually operable to provide first binary indications providing an address to an individual one of the vehicles and second binary indications providing commands for operating the individual one of the vehicles and each operable to provide the first and second binary indications to the central station for the transmission by the central station to the vehicles of the first and second binary indications from each of the pads,

a microcontroller in the central station,

a first line extending between the microcontroller and the pads in the plurality to provide an interrogation of such pads of the first and second binary indications from such pads,

10 a second plurality of lines each extending between the microcontroller and an individual one of the pads for providing clock signals to the individual one of the pads for controlling the time of the interrogation of such individual one of the pads by the central station, and

a plurality of third lines each extending between the microcontroller and an individual one of the pads for providing the first and second binary indications from the individual one of the pads to the central station in response to the interrogation by the central station to the individual one of the pads.

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64. In a combination as set forth in claim 63,

the second lines introducing the clock signals in sequence to the different ones of the pads on a cyclic basis to obtain an interrogation of the pads by the central station when the pads receive the clock signals, and

5 the third lines providing the first and second binary indications from the pads to the central station when the pads are interrogated by the central station.

65. In a combination as set forth in claim 63,

the second lines introducing the clock signals simultaneously to the different ones of the pads to obtain a simultaneous interrogation of the different pads by the central station, and

5 the third lines providing the first and second binary indications from the pads when the pads are interrogated by the central station.

66. In a combination as set forth in claim 63,

the clock signals having first and second polarities,

the interrogation of the pads in the plurality by the central station occurring when the clock signals on the second lines have a particular one of the first and second polarities.

67. In combination for use in a system including a central station and a plurality of vehicles and a plurality of pads each manually operable to provide first binary indications providing an address to an individual one of the vehicles and second binary indications providing commands for operating the individual one of the vehicles and each operable to provide the first and second binary indications to the central station for the transmission by the central station to the vehicles of the first and second binary indications from each of the pads,

a first line extending between the central station and the pads in the plurality to provide an interrogation of such pads of the first and second binary indications from such pads,

a second plurality of lines each extending between the central station and an individual one of the pads for providing clock signals to the individual one of the pads for controlling the time of the interrogation of such individual one of the pads by the central station, and

a plurality of third lines each extending between the central station and an individual one of the pads for providing the first and second binary indications from the individual one of the pads to the central station in response to the interrogation by the central station to the individual one of the pads,

the third lines also providing binary indications from the central station to each individual one of the pads in the plurality, after the provision of the first and second binary indications from such individual one of the pads to the central station, of the particular one of the vehicles addressed by each individual one of the pads.

68. In a combination as set forth in claim 67,

the second lines introducing the clock signals in sequence to the different ones of the pads on a cyclic basis to obtain an interrogation of the pads by the central station when the pads receive the clock signals, and

the third lines providing the first and second binary indications from the pads to the central station when the pads are interrogated by the central station,

each of the pads having a plurality of lights each indicating a different one of the vehicles, and

means for illuminating a particular one of the lights on each of the pads in accordance with the particular one of the vehicles addressed by such pad.

69. In a combination as set forth in claim 67,  
the second lines introducing the clock signals simultaneously to the different ones of the  
pads to obtain a simultaneous interrogation of the different pads by the central station, and  
the third lines providing the first and second binary indications from the pads when the  
5 pads are interrogated by the central station,  
each of the pads having a plurality of lights each indicating a different one of the vehicles,  
and  
means for illuminating a particular one of the lights on each of the pads in accordance  
with the particular one of the vehicles addressed by such pad.

70. In a combination as set forth in claim 63,  
the clock signals having first and second polarities,  
the interrogation of the pads in the plurality by the central station occurring when the  
clock signals on the second lines have a particular one of the first and second polarities,  
5 the illumination of the particular one of the lights on each of the pads by the indications  
from the central station to such pad through the third line for such pad in representation of the  
particular one of the vehicles addressed by such pad occurring when the clock signals on the  
second lines have the other one of the first and second polarities.

71. In combination for use in a system including a central station and a plurality of  
vehicles and a plurality of pads each manually operable to provide first binary indications  
providing an address to an individual one of the vehicles and second binary indications providing  
commands for operating the individual one of the vehicles and each operable to provide the first  
5 and second binary indications to the central station for the transmission by the central station to  
the vehicles of the first and second binary indications from each of the pads,  
a first line extending between the central station and the pads in the plurality to provide  
an interrogation of such pads of the first and second binary indications from such pads,

10 a plurality of second lines each extending between the central station and an individual one of the pads for providing clock signals to the individual one of the pads for controlling the time of interrogation of the individual one of the pads by the central station, and

a plurality of third lines each providing an indication from the central station to the individual one of the pads of the vehicle addressed by such individual one of the pads.

72. In a combination as set forth in claim 71,  
the clock signals having first and second polarities,

5 each of the third lines providing the first and second binary indications in an individual one of the pads to the central station in the first polarity of the clock signals and each providing an indication from the central station to the individual one of the pads, in the second polarity of the clock signals, of the vehicle addressed by such individual one of the pads.

73. In a combination as set forth in claim 72,

the second lines introducing the clock signals in sequence to the different ones of the pads on a cyclic basis to obtain an interrogation of the pads by the central station when the pads receive the clock signals, and

5 the third lines providing the first and second binary indications from the pads to the central station when the pads are interrogated by the central station.

74. In a combination as set forth in claim 73,

a plurality of lights in each of the pads, each of such lights providing an indication, when illuminated, of an individual one of the vehicles, and

5 means for illuminating an individual one of the lights in each of the pads in accordance with the indication from the central station to such pad of the vehicle addressed by such pad.

75. In a combination as set forth in claim 72,

the second lines introducing the clock signals simultaneously to the different ones of the pads to obtain a simultaneous interrogation of the different pads by the central station, and



the third lines providing the first and second binary indications from the pads when the pads are interrogated by the central station.

76. In combination for use in a system including a central station and a plurality of vehicles and a plurality of pads each manually operable to provide first binary indications providing an address to an individual one of the vehicles and second binary indications providing commands for operating the individual one of the vehicles and each operable to provide the first and second binary indications to the central station for the transmission by the central station to the vehicles of the first and second binary indications from each of the pads,

a first line extending between the central station and the pads in the plurality to provide an interrogation of such pads of the first and second binary indications from such pads,

a plurality of second lines each extending between the central station and an individual one of the pads for providing clock signals to the individual one of the pads for controlling the time of the interrogation of such individual one of the pads by the central station, and

a plurality of third lines each extending between the central station and an individual one of the pads for providing the first and second binary indications from the individual one of the pads to the central station in response to the interrogation by the central station to the individual one of the pads,

the extension of the third lines between the central station and the pads providing for the decoupling of any one of the pads from the central station without affecting the provision of the first and second binary indications from the other one of the pads to the central station.

77. In a combination as set forth in claim 76,

each of the third lines providing an indication from the central station to the individual one of the pads of the vehicle addressed by such individual one of the pads,

the extension of the third lines between the central station and the pads providing for the decoupling of any one of the pads from the central station without affecting the provision of the indications from the central station to the other pads of the vehicles addressed by such other ones of the pads.

78. In a combination as set forth in claim 76,

the extensions of the third lines between the central station and the pads providing for the extensions of additional third lines between additional pads and the central station to provide first and second binary indications from each of such additional pads to the central station in response to interrogations by the central station to the individual ones of such additional pads without affecting the provision of the first and second binary indications from the pads in the plurality to the central station.

79. In a combination as set forth in claim 77,

the extensions of the third lines between the central station and the pads providing for the extensions of additional third lines between additional pads and the central station to provide first and second binary indications from each of such additional pads to the central station in response to interrogations by the central station to the individual ones of such additional pads without affecting the provision of the first and second binary indications from the pads in the plurality to the central station and without affecting the provision of the indications from the central station to the pads in the plurality of the vehicles addressed by such pads in the plurality.

80. In combination for use in a system including a central station and a plurality of vehicles and a plurality of pads each manually operable to provide first binary indications providing an address to an individual one of the vehicles and second binary indications providing commands for operating the individual one of the vehicles and each operable to provide the first and second binary indications to the central station for the transmission by the central station to the vehicles of the first and second binary indications from each of the pads,

a first line extending between the central station and the pads in the plurality to provide an interrogation of such pads of the first and second binary indications from such pads,

a plurality of second lines each extending between the central station and an individual one of the pads for providing clock signals to the individual one of the pads for controlling the time of the interrogation of such individual one of the pads by the central station, and

a plurality of third lines each extending between the central station and an individual one of the pads for providing the first and second binary indications from the individual one of the

pads to the central station in response to the interrogation by the central station to the individual  
15 one of the pads,

the extensions of the third lines between the central station and the pads providing for the  
extensions of additional third lines between additional pads and the central station to provide first  
and second binary indications from each of such additional pads to the central station in response  
to interrogations by the central station to the individual ones of such additional pads without  
20 affecting the provision of the first and second binary indications from the pads in the plurality  
to the central station.

81. In a combination as set forth in claim 80,

the extensions of the third lines between the central station and the pads providing for the  
extensions of additional third lines between additional pads and the central station to provide first  
and second binary indications from each of such additional pads to the central station in response  
5 to interrogations by the central station to the individual ones of such additional pads without  
affecting the provision of the first and second binary indications from the pads in the plurality  
to the central station, and without affecting the provision of the indications from the central  
station to the pads in the plurality of the vehicles addressed by such pads in the plurality.

82. In combination for use in a system including a central station and a plurality of  
vehicles and a pad manually operable to provide first binary indications providing an address to  
an individual one of the vehicles and second binary indications providing commands for  
operating the individual one of the vehicles and operable to provide the first and second  
5 indications to the central station for the transmission by the central station to the vehicles of the  
first and second binary indications from the pad,

a first line extending between the central station and the pad to provide an interrogation  
of such pad of the first and second binary indications in such pad,

a second line extending between the central station and the pad for providing clock  
10 signals to the individual one of the pads for controlling the time of the interrogation of such pad  
by the central station,

a third line extending between the central station and the pad for providing the first and second binary indications from the pad to the central station in response to the interrogation by the central station to the pad,

- 15        first means for storing the first and second binary indications in the pad, and  
         second means associated with the second and third lines for providing a transfer of the binary indications in the first means to the third line when an interrogation of such pad is provided on the first line.

83. In a combination as set forth in claim 79 wherein  
the first means stores the first and second binary indications in a parallel form and  
the second means transfers the binary indications in the first means to the third means in a serial form.

84. In a combination as set forth in claim 82 wherein  
the first line provides a first voltage on the first line to provide an interrogation of the first and second binary indications in such pad and wherein  
the central station provides through the first line to the pad signals identifying the vehicle  
5        selected by the pad and wherein  
         the central station provides such identifying signals to the pad during the time that a second voltage different from the first voltage is on the first line.

85. In a combination as set forth in claim 84,  
the pad providing a plurality of lights each indicating, when illuminated, the addressing  
of such vehicle by the pad and wherein  
means are provided for illuminating a particular one of the lights in accordance with the  
5 signals passing through the third line from the central station to the pad.

86. In combination for use in a system including a central station and a plurality of  
vehicles and a pad manually operable to provide first binary indications providing an address to  
an individual one of the vehicles and second binary indications providing commands for  
operating the individual one of the vehicles and operable to provide the first and second binary  
5 indications to the central station for the transmission by the central station to the vehicles of the  
first and second binary indications from the pad,

a first line extending between the central station and the pad and having a first voltage  
at first particular times and having a second voltage at second particular times different from the  
first particular times,

10 a second line extending between the central station and the pad to provide a transfer of  
information between the central station and the pad,

first means for interrogating the pad to determine the pattern of the first and second  
binary indications in the pad when the first line has the first voltage,

15 second means operative during the production of the first voltage on the first line for  
passing the first and second binary indications in the pad to the central station for the  
transmission of such first and second binary indications by the central station to the pad, and

third means operative during the production of the second voltage on the first line for  
transmitting to the pad through the second line from the central station signals identifying an  
individual one of the vehicles addressed by the first binary indications from the pad.

87. In a combination as set forth in claim 86,  
there being in the pad a plurality of lights each indicating, when illuminated, an  
individual one of the vehicles addressed by the pad, and

means responsive to the signals passing through the second line from the central station  
5 to the pad during the production of the second voltage on the first line for illuminating the light  
identifying the individual one of the vehicles addressed by the first binary indications from the  
pad.

88. In combination for use with a plurality of vehicles each having an individual address  
and each operable when receiving the individual address,

a central station,

a plurality of pads each manually operable to address an individual one of the vehicles  
5 and each providing commands to operate the individual one the vehicles,

each of the pads being connected to the central station for receiving power from the  
central station to provide first binary indications addressing the individual one of the vehicles and  
second binary indications providing commands for operating the vehicles,

10 first means in the central station for interrogating each of the pads, separately from the  
interrogations of the other pads, to determine the first and second binary indications from the  
pads,

second means in the pads for transmitting the first and second binary indications from the  
pads to the central station upon the interrogation of the pads by the central station,

15 third means in the central station for transmitting to the vehicles the first and second  
binary indications determined from each of the pads,

the central station and the pads being constructed to provide for a disconnection of any  
particular one of the pads from the central station,

the first means being operative to interrogate the other pads upon the disconnection of  
the particular one of the pads from the central station,

20 the second means in the pads being operative to transmit the first and second binary  
indications from the other pads to the central station upon the disconnection of the particular one  
of the pads from the central station,

the third means in the central station being operative to transmit the first and second  
binary indications from the other pads to the vehicles upon the disconnection of the particular  
25 one of the pads from the central station, and

fourth means responsive in the central station to the disconnection of the particular one of the pads from the central station for freeing the vehicle addressed by the particular one of the pads to receive from the central station first binary indications provided by any particular one of the other pads and representing the address of such vehicle and second binary indications provided by such particular one of the other pads and representing commands to such vehicle and to be operated in accordance with such second binary indications.

89. In a combination as set forth in claim 88,

the first means being operative to interrogate the pads in the plurality on a cyclic basis before the disconnection of the particular one of the pads from the central station and to interrogate the pads in the plurality, other than the particular one of the pads, on the cyclic basis after the disconnection of the particular one of the pads from the central station.

90. In a combination as set forth in claim 88,

the first means being operative to interrogate the pads in the plurality simultaneously before the disconnection of the particular one of the pads from the central station and to interrogate the pads in the plurality, other than the particular one of the pads, simultaneously after the disconnection of the particular one of the pads from the central station.

91. In a combination as set forth in claim 88,

fifth means in each of the pads for providing for an illuminated indication in such pad of the individual one of the vehicles addressed by such pad, and

sixth means in each of the pads for providing in such pad an illumination indicating the individual one of the vehicles addressed by such pad, and

seventh means in the central station for discontinuing the illumination of the individual one of the vehicles addressed by the particular one of the pads when the particular one of the pads is disconnected from the central station.

92. In combination for use with a plurality of vehicles each having an individual address and each operable when receiving the individual address,

a central station,

a plurality of pads each manually operable to address an individual one of the vehicles  
5 and each providing commands to operate the individual one of the vehicles,

each of the pads being connected to the central station for receiving power from the  
central station to provide first binary indications addressing the individual one of the vehicles and  
second binary indications providing commands for operating the individual one of the vehicles,

first means in the central station for interrogating each of the pads, separately from the  
10 interrogations of the other pads, to determine the first and second binary indications from such  
pad,

second means in the pads for transmitting the first and second binary indications from the  
pads to the central station upon the interrogation of the pads by the central station,

third means in the central station for transmitting to the vehicles the first and second  
15 binary indications determined from each of the pads,

the central station and the pads being constructed to provide for the connection of an  
additional pad to the central station,

the first means in the central station being operative to interrogate the pads in the plurality  
and the additional pad upon the connection of the additional pad to the central station,

20 the second means in the pads being operative to transmit the first and second binary  
indications from the pads in the plurality and the additional pad to the central station upon the  
connection of the additional pad to the central station, and

the third means in the central station being operative to transmit the first and second  
binary indications from the pads in the plurality and the additional pad to the vehicles in the  
25 plurality upon the connection of the additional pad to the central station.

93. In a combination as set forth in claim 92,

the first means being operative to interrogate the pads in the plurality on a cyclic basis  
before the connection of the additional pad to the central station and to interrogate the pads in  
the plurality and the additional pad on the cyclic basis after the connection of the additional pad  
5 to the central station.



94. In a combination as set forth in claim 92,

the first means being operative to interrogate the pads in the plurality simultaneously before the connection of the additional pad to the central station and to interrogate the pads in the plurality and the additional pad

5 simultaneously after the connection of the additional pad to the central station.

95. In a combination as set forth in claim 92,

fourth means in each of the pads for providing for an illuminated indication in such pad of the individual one of the vehicles addressed by such pad,

5 fifth means in the central station for providing in such pad an illumination indicating the individual one of the vehicles addressed by such pad,

the fifth means in the central station being operative to continue the illumination of the vehicles addressed by the pads in the plurality and to provide an illumination of the vehicle addressed by the additional pad when the additional pad is connected to the central station.

96. In a combination as set forth in claim 1,

the pads in the plurality being connected to the central station, and

5 means in the central station for discontinuing the operation of the vehicle by the individual one of the pads when the additional one of the pads is disconnected from the central station.

97. In a combination as set forth in claim 5,

the pads in the plurality being connected to the central station, and

5 means in the central station for providing for the operation of the vehicle by the individual one of the pads when the second one of the pads is disconnected from the central station.

98. In a combination as set forth in claim 66,

the central station providing indications, through the third line for each of the pads, to such pad of the individual one of the vehicles selected by such pad, and

means in each of the pads for indicating the individual one of the vehicles selected by  
5 such pad in accordance with the indications provided by the central station to such pad through  
the third line for such pad.

99. In a combination as set forth in claim 75,  
a plurality of lights in each of the pads, each of such lights providing an indication, when  
illuminated, of an individual one of the vehicles, and

means for illuminating an individual one of the lights in each of the pads in accordance  
5 with the indication from the central station to such pad of the vehicle addressed by such pad.

100. In combination for use with a plurality of vehicles,  
a plurality of pads each operative to provide a first plurality of binary indications  
addressing an individual one of the vehicles and to provide a second plurality of binary  
indications providing commands to such individual one of the vehicles for operating such  
5 vehicle,

a central station,

first means in the central station for interrogating the pads to determine the first and  
second binary indications from such pads,

second means in the pads for transmitting the first and second binary indications from the  
10 pads to the central station, and

third means responsive in the central station to the identities of the first binary indications  
in successive transmissions of the first and second binary indications from each individual one  
of the pads to the central station for transmitting the first and second binary indications for such  
pad to the vehicles in the plurality.

101. In a combination as set forth in claim 100,

means in the central station for transmitting at each instant only the second binary  
indications from the pads which are providing changes in commands at that instant.

102. In a combination as set forth in claim 100,

the first means in the central station being operative to interrogate the pads on a cyclic basis to obtain the binary indications from each of the pads, on the cyclic basis with the other pads, of the individual one of the vehicles addressed by such pad and the binary indications for providing commands for operating the individual one of the vehicles.

103. In a combination as set forth in claim 100,

the first means in the central station being operative to simultaneously interrogate the pads to obtain simultaneously from the pads the first binary indications the individual ones of the vehicles and the second binary indications providing the commands for operating the individual ones of the vehicles.

104. In combination for operating a vehicle in accordance with addresses and commands provided by a pair of handheld pads and transmitted by a central station to the vehicle,

first means in the vehicle for receiving the addresses and commands provided by the pads and transmitted by the central station,

second means in the vehicle for identifying the received addresses as those of the vehicle,

third means responsive in the central station to the identification of the addresses received from the pads as those of the vehicle for providing for an execution of the received commands by the vehicle in accordance with such commands when the identified commands are complementary, and

fourth means responsive in the central station to the identification of the addresses received from the pads as those of the vehicle for providing for an execution by the vehicle of commands different from the commands provided by the pads when the commands are contradictory.

105. In a combination as set forth in claim 104,

fifth means responsive in the vehicle to the discontinuance of one of the pads in the plurality in addressing the vehicle for continuing the response of the vehicle to the addresses and commands from the other one of the pads in the pair.

106. In a combination as set forth in claim 23,

the first means being operative to interrogate the pads in the plurality and an additional pad on a cyclic basis,

the second means being responsive on the cyclic basis to the interrogation provided by  
5 the first means of the pads in the plurality and the additional pad sending the addresses and commands to the addressed vehicles to obtain an operation of such vehicles in accordance with such commands.

107. In a combination as provided in claim 26,

the first means being operative to interrogate the pads on a cyclic basis.

108. In combination for use in a system including a plurality of vehicles each responsive to an individual address and to a plurality of commands for providing individual operations of vehicles in accordance with such commands,

a plurality of pads each operative to provide an address for selecting an individual one  
5 of the vehicles and to provide commands to such individual one of the vehicles for operating such individual one of the vehicles in accordance with such commands,

a central station connected to the pads,

first means in the central station for interrogating the pads on a cyclic basis to determine the address and the commands provided by such pads,

10 second means responsive in the central station to the interrogation provided by the first means in the central station concerning the address and the commands from such pad for receiving the address and the commands from such pad and for transmitting the address and the commands from such pad to the vehicles in the plurality, and

third means responsive in the central station to any change in the address or commands  
15 from an individual one of the pads for transmitting the address and the commands from such pad  
to the vehicles in the plurality on a priority basis.

109. In a combination as set forth in claim 108 wherein  
the central station discontinues the interrogation of any pad which is disconnected from  
the central station.

110. In a combination as set forth in claim 108 wherein  
the central station transmits the address and commands from the individual one of the  
pads in the plurality to the vehicles in the plurality only when the central station has completed  
the transmission to the vehicles in the plurality of the address and commands of the pad whose  
5 address and commands the central station has been transmitting at the time that the central station  
receives the change in the address and the commands from the individual one of the pads in the  
plurality.

111. In combination for use in a system including a plurality of vehicles each responsive  
to an individual address and to a plurality of commands for providing individual operations of  
vehicles in accordance with such commands,

a plurality of pads each operative to provide an address for selecting an individual one  
5 of the vehicles and to provide commands to such individual one of the vehicles for operating  
such individual one of the vehicles in accordance with such commands,

a central station connected to the pads,

first means in the central station for interrogating the pads on a cyclic basis to determine  
the address and the commands provided by such pads,

10 second means responsive in the central station to the interrogation provided by the first  
means in the central station concerning the address and the commands from such pads for  
receiving the address and the commands from such pads and for transmitting the address and the  
commands from such pads to the vehicles in the plurality, and

third means responsive in the central station to the coupling of an individual one of the pads to the central station and to the reception by such central station of an address and commands from such individual one of the pads for transmitting such address and commands from such individual one of the pads on a priority basis.

112. In a combination as set forth in claim 111 wherein the central station for transmitting to the vehicles at each instant only the commands from the pads which are providing changes in commands at that instant.

113. In a combination as set forth in claim 111 wherein the central station transmits the address and commands from the individual one of the stations in the plurality to the vehicles in the plurality only when the central station has completed the transmission to the vehicles in the plurality of the address and commands of the pad whose address and commands the central station has been transmitting at the time that the central station receives the address and the commands from the individual one of the pads in the plurality.

114. In combination for use in a system including a plurality of vehicles each responsive in a first relationship to an individual address and to a plurality of commands for providing operations of such individual one of the vehicles in accordance with such commands, the system including, in a second relationship, at least one auxiliary accessory for receiving commands,

a plurality of pads each operative to provide an address for selecting an individual one of the vehicles and to provide commands to such individual one of the vehicles for operating such individual one of the vehicles in accordance with such commands and each operative to provide an additional command indicating whether or not the individual one of the vehicles or the auxiliary accessory is to be operated,

a central station connected to the pads,

first means in the central station for interrogating the pads to determine the address and the commands and the additional command provided by such pads,

second means in the central station for receiving the address and the commands and the additional command from each of the pads,

15        a smart port in the central station for receiving commands intended by the pads to be directed to the auxiliary accessory,

third means responsive in the central station to the additional command from the pads for determining from the additional command whether or not the commands from the pads are intended for the vehicles or for the auxiliary accessory,

20        fourth means in the central station for directing the commands from the pads to the smart port when the central station determines from the additional command that the commands are intended by the pads for the additional accessory, and

25        fifth means in the central station for processing the address and commands in a first relationship to provide a first pattern of binary indications when the central station determines from the additional command from the pads that the commands from the pads are not to be directed to the smart port and for processing the commands in a second relationship different from the first relationship to provide a second pattern of binary indications when the central station determines from the additional command from the pads that the commands are to be directed to the smart port, and

30        sixth means in the central station for transmitting the first and second patterns of the binary indications.

115. In a combination as set forth in claim 114,

a first microcontroller,

a second microcontroller,

5        the fifth means including the first microcontroller for processing the address and the commands in the first relationship to provide the first pattern of binary indications when the central station determines from the additional command from the pads that the commands from the pads are not to be directed to the smart port,

the fifth means including the second microcontroller for providing the commands in the second relationship to provide the second pattern of the binary indications when the central

10 station determines from the additional command from the pads that the commands are to be directed to the smart port.

116. In combination,  
a plurality of vehicles,  
an auxiliary accessory different from the vehicles,

5 a pad operative to provide an address for selecting an individual one of the vehicles and to provide commands to such individual one of the vehicles for operating such individual one of the vehicles in accordance with such commands and to provide an additional command indicating whether or not such individual one of the vehicles is to be operated or the auxiliary accessory is to be operated,

10 a central station connected to the pad,  
first means in the central station for receiving the address and the commands and the additional command from the pad,

a smart port in the central station for receiving the commands intended to be directed to the auxiliary accessory,

15 second means responsive in the central station to the additional command from the pad for determining from such additional command whether or not the commands from the pad are intended for the vehicle or for the auxiliary accessory,

third means in the central station for directing the commands from the pad to the smart port when the central station determines from the additional command that the commands are intended for the additional accessory,

20 fourth means in the central station for processing the address and commands in a first relationship to provide a first pattern of binary indications when the central station determines from the additional command in the pad that the commands from the pad are not to be directed to the smart port and for processing the commands in a second relationship different from the first relationship to provide a second pattern of binary indications when the central station  
25 determines from the additional command in the pad that the commands are to be directed to the smart port,



fifth means in the central station for transmitting the first and second patterns of the binary indications to the vehicle and the auxiliary accessory,

sixth means in the individual one of the vehicles for operating the vehicle in accordance with the first pattern of the binary indications, and

seventh means in the auxiliary accessory for operating the auxiliary accessory in accordance with the second pattern of the binary indications.

117. In a combination as set forth in claim 116,

a first microcontroller,

a second microcontroller,

the fourth means including the first microcontroller for processing the address and the commands in the first relationship to provide the first pattern of binary indications when the central station determines that the commands from the pads are not to be directed to the smart port,

the fourth means including the second microcontroller for providing the commands in the second relationship to provide the second pattern of the binary indications when the central station determines that the commands are to be directed to the smart port.

118. In a combination as set forth in claim 116 wherein

the central station is a first central station and the plurality of pads constitute a first plurality and the plurality of vehicles constitute a first plurality and wherein

the auxiliary accessory is a second central station and wherein a second plurality of pads and a second plurality of vehicles are associated with the second central station and wherein the binary indications in the second pattern direct the second central station to be a slave to the first central station.

119. In combination for use in a system including a plurality of vehicles each responsive, in a first relationship, to an individual address and to a plurality of commands for providing operations of such individual one of the vehicles in accordance with such commands, the system including, in a second relationship, at least one auxiliary accessory for receiving commands,

5 a plurality of pads each operative to provide an address for selecting an individual one of the vehicles and each operative to provide a plurality of commands for operating such individual one of the vehicles in accordance with such commands,

a central station connected to the pads,

a smart port constructed to be connected to the central station,

10 first means in the central station for interrogating the pads to determine if the smart port is connected to the central station,

second means in the central station for passing the commands from the pads through the smart port when the central station determines that the smart port is connected to the central station,

15 third means associated with the central station for processing the commands from the pads in a particular relationship, when the central station determines that the smart port is connected to the central station, to provide commands for operating the auxiliary accessory, and

fourth means in the central station for transmitting the commands in the particular relationship when the smart port is connected to the central station.

120. In a combination as set forth in claim 119,

the particular relationship constituting a first particular relationship,

means in the central station for processing the commands from the pads in a second particular relationship different from the first particular relationships, when the central station  
5 determines that the smart port is not connected to the central station, to provide commands for operating the individual one of the vehicles,

the fourth means in the central station being operative to transmit the commands in the second particular relationship when the smart port is not connected to the central station.

121. In a combination as set forth in claim 120 wherein

the central station is a first central station and the plurality of the pads constitute a first plurality and the plurality of the vehicles constitute a first plurality and wherein the auxiliary accessory is a second central station and wherein a second plurality of pads and a second  
5 plurality of vehicles are associated with the second central station and wherein the binary

indications in the first particular pattern direct the second central station to be a slave to the first central station.

122. In combination for use in a system including a plurality of vehicles each responsive to an individual address and to a plurality of commands for providing individual operations of the vehicles in accordance with such commands,

5 a plurality of pads each operative to provide an address for selecting an individual one of the vehicles and to provide commands to such individual one of the vehicles for operating such individual one of the vehicles in accordance with such commands,

a central station connected to the pads,

first means in the central station for interrogating the pads to determine the address and the commands provided by such pads,

10 second means responsive in the pads to the interrogation by the central station for transmitting the address and the commands from the pads to the central station,

third means in the central station for receiving the addresses and the commands transmitted by the pads, and

15 fourth means in the central station for transmitting to the vehicles in the plurality only the commands transmitted from each pad to the central station that are different from the immediately preceding commands transmitted from such pad to the central station.

123. In a combination as set forth in the claim 122,

the first means in the central station being operative to interrogate the pads on a cyclic basis and the pads being operative to transmit the address and the commands from such pads to the central station when interrogated.

124. In combination for use in a system including a plurality of vehicles each responsive to an individual address and to a plurality of commands for providing individual operations of the vehicles in accordance with such commands,

5 a plurality of pads each operative to provide an address for selecting an individual one of the vehicles and to provide commands to such individual one of the vehicles for operating such individual one of the vehicles in accordance with such commands,

a central station connected to the pads,

10 a plurality of first switches each included in an individual one of the pads and having first and second modes, of operation and operative in the first mode a successive number of times to address an individual one of the vehicles,

each of the pads including a plurality of lights each indicating an individual one of the vehicles when illuminated,

first means in the central station for remembering at each instant the individual ones of the vehicles being addressed by the pads at that instant,

15 a plurality of second switches each having first and second operative relationships and each disposed in an individual one of the pads and each operative in the first relationship to provide for the selection of only one of the vehicles by such individual one of the pads and operative in the second relationship to provide for the address by any other one of the pads of the same vehicle addressed by such individual one of the pads,

20 second means responsive in each of the pads to the operation of the first means in the central station and to the operation of the second switch in such pad in the first relationship for skipping over the lights representing in such pad the vehicles being addressed by the pads when the first switch in such pad receives successive actuations to the first mode of operation, and

25 third means responsive, in the other one of the pads to the operation of the first means in the central station and to the operation of the second switch in the individual one of the pads in the second relationship, for including in the sequence of lights in such other one of the pads the light in the vehicle addressed by such individual one of the pads in the second mode of operation of the second switch in such individual one of the pads.

125. In a combination as set forth in claim 124,

means in the central station for transmitting the address and commands from the individual one of the pads and such other one of the pads to the vehicle addressed by such

individual one of the pads when the second switch in such individual one of the pads is in the  
5 second mode of operation.

126. In combination,

a plurality of vehicles each having an individual address,

a plurality of pads each operative to provide an address for selecting an individual one  
of the vehicles and to provide commands to such individual one of the vehicles for operating  
5 such individual one of the vehicles in accordance with such commands,

a central station connected to the pads,

each of the pads being operative to transmit the address and the commands from such pad  
to the central station for transmission by the central station to the vehicles,

each individual one of the vehicles having a light for illumination when such vehicle is  
10 addressed and commanded by the central station as a result of the address and commands from  
an individual one of the pads,

first means in the central station for storing the addressing by each individual one of the  
pads of the individual one of the vehicles,

second means in the central station for communicating to the individual one of the  
15 vehicles to extinguish the light in such vehicle when the individual one of the pads providing the  
address and the commands to such individual one of the vehicles becomes disconnected from the  
central station, and

third means in each individual one of the vehicles for extinguishing the light in such  
individual one of the vehicles in accordance with the communication from the central station.

127. In a combination as set forth in claim 126,

fourth means in the central station for eliminating the storage of the addressing by each  
individual one of the pads of the individual one of the vehicles when such individual one of the  
pads becomes disconnected from the central station.

128. In a combination as set forth in claim 127,

fifth means in the central station for interrogating on a cyclic basis the pads connected to the central station to determine the address and the commands from such pad to the vehicles,

sixth means for receiving the address and the commands from each of the pads upon the  
5 interrogation of such pad by the central station, and

seventh means in the central station for eliminating one of the pads from the cyclic interrogation when such pad becomes disconnected from the central station.

129. In combination for use in a system including a plurality of vehicles each responsive in a first relationship to an individual address and to a plurality of commands for providing operations of such individual one of the vehicles in accordance with such commands, the system including, in a second relationship, at least one auxiliary mechanism for receiving commands,

5 a central station,

a port in the central station, the port being either a smart port or a dumb port, the port being connectible to the auxiliary accessory,

first means in the central station for determining whether the port is a smart port or a dumb port,

10 a plurality of pads each operative to provide an address for selecting an individual one of the vehicles and to provide commands to such individual one of the vehicles for operating such individual one of the vehicles in accordance with such commands and each providing commands to operate the auxiliary accessory when the port is a dumb port,

the central station being connected to the pads,

15 second means in the central station for processing the addresses and commands from the pads to obtain an operation of the vehicles in accordance with such addresses and commands,

third means in the central station for operating the auxiliary accessory in accordance with the commands from the pad when the central station determines that the port is a dumb port, and

20 fourth means for converting the commands from the pads to commands for operating the auxiliary accessory when the central station determines that the port is a smart port.

130. In a combination as set forth in claim 130,

fifth means in the central station for transmitting the address and the commands from the second means when the central station determines that the port is a dumb port and for transmitting the commands from the fourth means for operating the auxiliary accessory when the central station determines that the port is a smart port.

131. In a combination as set forth in claim 129,

the second means including a first microcontroller and the fourth means including a second microcontroller different from the first microcontroller.

132. In combination for use in a system including a plurality of vehicles each responsive in a first relationship to an individual address and to a plurality of commands for providing operations of such individual one of the vehicles in accordance with such commands, the system including, in a second relationship, at least one auxiliary mechanism for receiving commands,

a central station including a first microcontroller,

a plurality of pads each operative to provide an address for selecting an individual one of the vehicles and to provide commands to such individual one of the vehicles for operating such individual one of the vehicles in accordance with such commands and each providing commands to obtain the operation of the auxiliary mechanism,

a second microcontroller,

first means in the central station for processing the commands from the pads for determining whether such commands are intended for the vehicles or the auxiliary accessory,

second means in the central station including the first microcontroller for processing the address and commands for operation of the vehicles when the central station determines that the commands are intended for the vehicles and for introducing the addresses and commands to the second microcontroller when the central station determines that the addresses and commands from the pads are intended for the auxiliary accessory, and

third means including the second microcontroller for processing the addresses and commands from the central station to provide commands for operating the auxiliary accessory when the central station determines that the addresses and commands from the pads are intended for the auxiliary accessory.

133. In a combination as set forth in claim 132,

means in the central station for transmitting the processed addresses and commands from the first microcontroller when the central station determines that the addresses and commands from the pads are intended for the vehicles and for transmitting the commands from the third means when the central station determines that the addresses and commands from the pads are intended for the auxiliary apparatus.

134. In a combination as set forth in claim 132,

the first microcontroller being operative to pass the commands from the pads to the second microcontroller when the central station determines that the commands are intended for the auxiliary accessory,

the second microcontroller being operative to receive and process the commands from the first microcontroller simultaneously with the passage of the commands from the first microcontroller to the second microcontroller and to pass the processed commands from the second microcontroller to the first microcontroller during the passage of the commands from the first microcontroller to the second microcontroller.

135. In a combination as set forth in claim 132,

the first microcontroller being operating to pass successive groups of commands to the second microcontroller when the central station determines that the commands are intended for the auxiliary accessory,

the second microcontroller being operative to receive and process the commands from the first microcontroller simultaneously with the passage of commands from the first microcontroller to the second microcontroller,

the first microcontroller being responsive to the passage of the processed commands in each group from the second microcontroller to the second microcontroller for passing the commands in the next one of the successive groups from the first microcontroller to the second microcontroller for processing by the second microcontroller.



136. In combination for use with a central station and a plurality of pads operatively coupled to the central station and each operative to provide an address, and commands following such address, to the central station for transmission by the central station,

5 a plurality of vehicles each constructed to receive the addresses and commands transmitted by the central station from the pads and to respond to an individual one of the addresses from the central station and to operate in accordance with the commands following such individual one of the addresses,

10 first means in each of the vehicles for powering such vehicle for operation in accordance with the reception by such vehicle from the central station of the address individual to such vehicle and the commands following such address,

second means in each of the vehicles for depowering such vehicle when such vehicle fails to receive from the central station for a particular period of time the address individual to such vehicle or the commands following such address,

15 third means in each of the vehicles for determining the time since the last reception of a command from the central station to such vehicle, and

fourth means in each of the vehicles for providing a first indication with such vehicle in the powered state, a second indication different from the first indication with the vehicle in the depowered state and a third indication different from the first and second indications for a particular period of time before such vehicle becomes depowered.

137. In a combination as set forth in claim 136 wherein

5 the fourth means in each of the vehicles includes a light having a first state of illumination with such vehicle in the powered state, a second state of illumination with such vehicle in the depowered state and a third state of illumination for the particular period of time before such vehicle becomes depowered.

138. In combination,

a plurality of vehicles each responsive to an individual addresses for operation in accordance with commands provided to such vehicle,

a plurality of pads each operative to provide the address individual to such vehicles and  
5 to provide commands for operating such vehicles,

a central station operatively coupled to the pads for transmitting the addresses and  
commands from the pads to the vehicles,

first means in each of the vehicles for powering such vehicle in accordance with the  
address and commands provided by the central station to such vehicle,

10 second means in the central station for determining the period of time since the last time  
that each of the vehicles has received commands from the central station,

third means in the central station for transmitting a first signal to each vehicle to depower  
such vehicle when the central station fails to transmit any commands to such vehicle for a  
particular period of time,

15 fourth means in the central station for transmitting a second signal to each vehicle a  
particular period of time before such vehicle becomes depowered,

fifth means in each of the vehicles for providing a first indication when such vehicle is  
being powered,

sixth means in each of the vehicles for providing a second indication when such vehicle  
20 is depowered, and

seventh means in each of the vehicles for providing a third indication during the particular  
period of time before such vehicle is depowered.

139. In a combination as set forth in claim 138,

means in each of the vehicle for activating such vehicle upon the reception by such  
vehicle from the central station of the address individual to such vehicle and for operating the  
vehicle in accordance with the commands following such individual address.

140. In a combination as set forth in claim 139,

each of the vehicles having a light,

the sixth means in each of the vehicles being operative to provide a first state of  
illumination of the light in such vehicle,

5           the seventh means in each of the vehicles being operative to provide a second state of illumination of the light in such vehicle,

          the eighth means in each of the vehicles being operative to provide a third state of illumination of the light in such vehicle.

141. In a combination as set forth in claim 139,

sixth means in each of the vehicles for determining the period of time since the last reception by such vehicle of commands addressed to such vehicle and for depowering such vehicle after the particular period of time.

142. In combination,

a plurality of vehicles each responsive to an individual address provided to such vehicle and each operative in accordance with commands provided to such vehicle after the reception by such vehicle of such individual address,

5 a plurality of pads each operative to provide the addresses individual to such vehicles and to provide the commands for operating such vehicles,

a central station operatively coupled to the pads for receiving the addresses and the commands from the pads and for providing carrier signals at a particular frequency and for modulating the carrier signals in accordance with the addresses and commands from the pads,

10 means in the central station for transmitting the modulated carrier signals to the vehicles,

means in each of the vehicles for powering such vehicle upon the reception by the vehicle from the central station of carrier signals modulated with the address individual to such vehicle and the commands following such address,

15 means responsive in each of the vehicle to the address individual to such vehicle for operating the vehicle in accordance with the commands following such address, and

means responsive in each of the vehicles to the failure of such vehicle to receive carrier signals from the central station for depowering such vehicle.

143. In a combination as set forth in claim 142,

means in each of the vehicles for providing a first state of illumination in such vehicle with such vehicle powered and a second state of illumination in such vehicle with such vehicle depowered.

144. In combination for use with a plurality of pads each operative to provide an address and commands and a central station for transmitting at a particular frequency a carrier signal modulated with the addresses and commands from the pads,

a vehicle,

5 means in the vehicle for receiving from the central station the carrier signals modulated with the address individual to such vehicle,

means for powering the vehicle in accordance with the reception by such vehicle of the modulated carrier signals individual to such vehicle,

10 means in the vehicle for demodulating the modulating carrier signals to recover the commands individual to such vehicle,

means for operating the vehicle in accordance with the commands recovered by such vehicle, and

means in the vehicle for depowering the vehicle upon the failure of the vehicle to receive carrier signals from the central station.

145. In a combination as set forth in claim 144,

the vehicle including wheels and an operating member different from the wheels,

5 the operating means being responsive to the demodulated commands for operating the wheels to move the vehicle, and for operating the member, in accordance with such demodulated commands.

146. In combination for use with a plurality of pads each operative to provide an address and commands and a central station for transmitting at a particular frequency a carrier signal modulated with the addresses and commands from the pads,

a vehicle,

5 means in the vehicle for receiving from the central station the carrier signals modulated with the address individual to such vehicle,

means for powering the vehicle in accordance with the reception by such vehicle of the modulated carrier signals individual to such vehicle,

means in the vehicle for demodulating the modulating carrier signals to recover the  
10 commands individual to such vehicle,

the vehicle including wheels for moving the vehicle and including motors for rotating the  
wheels,

means in the receiver for providing pulse width modulations for energizing the motors  
in the vehicle to move the vehicle, the pulse width modulations providing progressive increments  
15 of time for energizing the motors to accelerate the vehicle, and

means in the receiver for progressively energizing the motors with the pulse with  
modulations for the progressive increments of time to accelerate the motors.

147. In a combination as set forth in claim 146,

the vehicles being progressively energized with the pulse width modulations for the  
progressive increments of time from a zero time in the pulse width modulations to accelerate the  
motors in the vehicle.

148. In combination,

a plurality of vehicles each responsive to an individual address provided to such vehicle  
and each operative in accordance with commands provided to such vehicle after the reception  
by such vehicle of such individual address,

5 a plurality of pads each operative to provide the addresses individual to such vehicles and  
to provide the commands for operating such vehicles,

a central station operatively coupled to the pads for receiving the addresses and the  
commands from the pads and for transmitting such addresses and commands to the vehicles in  
packets each composed of a plurality of binary indications representing the address and the  
10 commands for an individual one of the vehicles and each having start bits at the beginning of the  
packet and having the address following the start bits and having the commands following the  
address, the packets from the different pads in the plurality following one another with no time  
separation between successive ones of the packets,

means in the central station for transmitting the packets of the binary indications to the  
15 vehicles,

means in the vehicles for receiving the packets of the binary indications transmitted by the central station, and

means responsive in each of the vehicles to the address individual to such vehicle for operating the vehicle in accordance with the commands following such address.

149. In a combination as set forth in claim 148,

each of the vehicles having wheels,

each of the vehicles having an operating member different from the wheels, and

5 each of the packets including first commands for rotating the wheels in an individual one of the vehicles in accordance with the binary indications representing in such packet such individual one of the vehicles and including second commands for rotating the wheels in such individual one of the packets and including third commands for operating the member in such individual one of the packets,

10 means in each of the vehicles for rotating the wheels in such vehicle in accordance with the first commands in the packets addressed to such vehicle, and

means in each of the vehicles for operating the operating member in such vehicle in accordance with the second commands in the packets addressed to such vehicle.

150. In combination,

a plurality of vehicles each responsive to an individual address for operation in accordance with commands provided to such vehicle,

5 a plurality of pads each operative to provide the addresses individual to such vehicles and to provide commands for operating such vehicles,

a central station operatively coupled to the pads for transmitting the addresses and commands from the pads to the vehicles,

a light indication in each of the vehicles, and

10 means in each of the vehicles for providing an illumination of the light in the vehicle when an individual one of the pads addresses the vehicle and before the vehicle receives the commands from such individual one of the pads.

151. In a combination as set forth in claim 150,  
means in each vehicle for powering such vehicle when the individual one of the pads  
addresses such vehicle, and  
means in each of the vehicles for depowering such vehicle when the vehicle fails to  
receive commands from any of the pads for a particular period of time.



ABSTRACT OF THE DISCLOSURE

A system and method for controlling toy vehicles has a plurality of pads coupled to a central station. Switches in the pads may be closed to select toy vehicles and the operation of motors for moving the vehicles forwardly, rearwardly, to the left and to the right and moving upwardly and downwardly a receptacle or bin for holding transportable elements (e.g. marbles). The pads may be set in a mode to allow sharing of a vehicle by more than one pad. The pads are connected by wires to the central station, and may be interrogated selectively, sequentially or simultaneously by the central station. The central station forms packets of signals representative of the switch closures of the interrogated pads, and transmits the packets over a modulated carrier frequency to receivers in the vehicles. Each of the packets includes a binary signal addressing the vehicle selected by the pad whose switch closures are represented by the packet of data. The central station prioritizes the transmission of the packets to improve vehicle control. An accessory, or a second central station, may be coupled to a smart port of the first central station. When the pads are interrogated by the central station, the signals from the pads may be routed to the accessory or second central station for processing, then sent back to the first central station for transmission to the vehicles. The pads include a flashback feature that automatically selects a previously selected vehicle. The motors of the vehicles may be energized using pulse width modulation to control the speed of the motor. Signals received by the vehicle are asserted to the motors in the first part of a duty cycle. The vehicles monitor all packets, and decode packets addressed to the vehicle to execute the commands represented by signals contained within the packet. When a packet is determined to be invalid, the vehicle ignores the packet.

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Ellsworth R. Roston, Reg. No. 16,310

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of	)	Date: August 13, 1999
	)	
PETER C. DeANGELIS	)	Group No.: 3712
	)	
Serial No.: 08/797,188	)	Examiner: D. Muir
	)	
Filed: February 11, 1997	)	Docket No.: ROKEN-40907
	)	
For: SYSTEM AND METHOD FOR	)	Los Angeles, California 90024
CONTROLLING THE	)	
OPERATION OF TOYS	)	[#147026:v1]

**PRELIMINARY AMENDMENT**

BOX CPA  
Assistant Commissioner for Patents  
Washington, D.C. 20231

Sir:

The above-captioned application is a continuation under 37 C.F.R. §1.53(d) of  
U.S. Serial No. 08/797,177; filed February 11, 1997.

**EXPRESS MAIL NO. EL280119687US**

**PLEASE REWRITE THE CLAIMS SPECIFIED BELOW AS FOLLOWS:**

Claim 23 (amended): In combination for use in a system including a plurality of vehicles each responsive to an individual address and to a plurality of commands for providing individual operations of the vehicles in accordance with such commands,

5 a plurality of pads each operative to provide an address for selecting any individual one of the vehicles and to provide commands to such individual one of the vehicles for operating such individual one of the vehicles in accordance with such commands,

a central station, [connected to the pads,] the pads being connected to the central station.

10 first means in the central station for interrogating the pads to determine the address and the commands provided by such pads,

second means responsive in the central station to the interrogation provided by the first means in the central station concerning the address and the commands from each pad for sending the address and the commands from such pad to the vehicle addressed by  
15 such pad to obtain an operation of such vehicle in accordance with such commands,

the first means in the central station being operative to interrogate any additional pad connected to the central station at the instant that such additional pad is connected to the central station, and

20 the second means being responsive in the central station to the interrogation provided [on the cyclic basis] by the first means in the central station concerning the address and the commands from the pads in the plurality and from the additional pad for sending signals representing the address and the commands from each such pad to the vehicle addressed by such pad, instantaneously after the additional pad is connected to the central station, to obtain an operation of such vehicle in accordance with such commands  
25 without affecting the interrogation of the pads in the plurality by the central station.

Claim 24 (amended): In a combination as set forth in claim 23,

third means in the central station for providing for the sending [transmitting] at each instant by the second means of only the commands from the pads which are providing changes in addresses or commands at that instant.

5 Claim 25 (amended): In a combination as set forth in claim 23,

the first means being operative to eliminate from interrogation by the central station <sup>of</sup> any one of the pads disconnected in the plurality from the central station and to  
provide such elimination at the instant that the pad is disconnected from the central

10      station and without affecting the interrogation of the other pads by the central station and  
to provide for the addressing by any of the pads, other than the disconnected pad, of the  
vehicle previously addressed by the disconnected pad.

Claim 26 (amended): In combination for use in a system including a plurality of vehicles each responsive to an individual address and to a plurality of commands for providing individual operations of the vehicles in accordance with such commands,

5      a plurality of pads each operative to provide an address for selecting any individual one of the vehicles and to provide commands to such individual one of the vehicles for operating such individual one of the vehicles in accordance with such commands,

a central station [connected to the pads], the pads being connected to the central station,

10      first means in the central station for interrogating the pads to determine the address and the commands provided by such pads,

second means responsive in the central station to the interrogation provided by the first means in the central station concerning the address and the commands from each pad for sending signals representing the address and the commands from such pad to the vehicle addressed by such pad to obtain an operation of such vehicle in accordance with such commands,

15

the first means in the central station being operative to eliminate, from the interrogation, any one of the pads disconnected in the plurality from the central station and to provide such elimination at the instant that the pad is disconnected from the central  
20 station and to provide such elimination without affecting the interrogation of the other  
pads by the central station and to provide for an addressing by any pad, other than the  
disconnected pad, of the vehicle previously addressed by the disconnected pad,

the second means being responsive in the central station to the interrogation provided by the first means in the central station concerning the address and the  
25 commands from each of the pads interrogated by the central station for sending the signals representing the address and the commands from each such pad to the vehicle addressed by such pad to obtain an operation of such vehicle in accordance with such commands.

Claim 27 (amended): In a combination as set forth in claim 26,

third means in the central station for [transmitting] providing for the transmission  
at each instant by the second means only of the commands from the pads which are providing changes in addresses or commands at that instant.

Claim 28 (amended): In combination for use in a system including a plurality of vehicles each responsive to an individual address and to a plurality of commands for providing individual operations of the vehicles in accordance with such commands,

5 a plurality of pads each including a first switch having [open] first and [closed] second states and operative to provide an address to any individual one of the vehicles dependent upon the number of the operations of such switch [closures] in the second state and including [a plurality of] second switches each having [open] first and [closed] second states and operative in the [closed] second state to provide a particular operation of the individual one of the vehicles,

10 a central station responsive to the [closures] operation of the first switch in each of the pads in the second state for providing an address to any individual one of the vehicles dependent upon the number of operations of such first switch [closures] in such pad in the second state and responsive to the [closures] operations of the second switches in such pad in the second state for providing signals representing operations to be performed by  
15 such individual one of the vehicles, and

means responsive in the central station to the [closures] operations in the second state of [individual pairs of] the second switches providing in [each] a pair of the pads contradictory commands to the individual one of the vehicles for converting such contradictory commands to signals providing specialized commands different from the

20 commands provided by the [closure] operation of the different ones of the second switches in such pads.

Claim 29 (amended): In a combination as set forth in claim 28,

means in the central station for providing at each instant only the commands from the pads which are providing changes in addresses or commands at that instant, and

5 means in the central station for sending to the vehicles in the plurality the commands provided by the last mentioned means in the central station.

Claim 36 (amended): In combination for use with a plurality of vehicles,

a plurality of pads each operative to [identify] address any individual one of the vehicles [addressed by such pad] and to provide a plurality of binary indications providing commands for operating the [individual one of the] addressed vehicle[s] identified by such address],

5 a central station,

first means operatively coupled in the central station to the pads in the plurality for providing packets of signals identifying for each pad the individual one of the vehicles addressed by such pad and the commands for operating the individual one of the vehicles, and

10



second means responsive in each vehicle to the same identity of the signals providing the commands in two (2) successive packets addressed to such vehicle by the first means in the central station for operating such vehicle in accordance with the pattern of the signals in such packets.

Claim 37 (amended): In a combination as set forth in claim 36,  
means in the central station for interrogating the pads on a cyclic basis to obtain binary indications from each of the pads, on the cyclic basis with the other pads, of the individual one of the vehicles addressed by such pad and the binary indications providing  
5 commands for operating the individual one of the vehicles addressed by such pad.

Claim 38 (amended): In a combination as set forth in claim 36,  
means in the central station for transmitting to the vehicles at each instant only the binary indications from [th epads] the pads which are providing changes in addresses or commands at that instant.

Claim 39: In a combination as set forth in claim 38,  
means in the central station for simultaneously interrogating the pads to obtain simultaneous binary indications from the pads of the individual ones of the vehicles

5 addressed by such pads and the binary indications providing the commands for operating the individual ones of the vehicles.

Claim 45 (amended): [In a combination as set first in [Exhibit] claim 43] In combination for use in a vehicle for moving the vehicle in accordance with commands which are provided by a pad to control the movements of the vehicle and which are converted by a central station to commands addressed by the central station to the vehicle to obtain the movements of the vehicle,

a pair of left wheels in the vehicle, the left wheels being spaced from each other in a longitudinal direction,

a pair of right wheels in the vehicle, the right wheels having the same spacing in the longitudinal direction as the left wheels,

10 a first motor in the vehicle for moving the left wheels in the vehicle in the longitudinal direction,

a second motor in the vehicle for moving the right wheels in the vehicle in the longitudinal direction,

15 the commands addressed to the vehicle from the central station including first signals for operating the first motor and second signals for operating the second motor,

first means in the vehicle for receiving the commands addressed to the vehicle from the central station,

second means responsive in the vehicle to the first and second signals received by the vehicle from the central station for operating the first and second motors in accordance with such signals,

the vehicle being operative in a powered and active state and in a powered and inactive state,

third means responsive in the vehicle to the failure of the vehicle in the powered and active state to receive the first and second signals for a particular period of time for maintaining the same operation of the first and second motors for such particular period of time as the operation of the motors upon the last reception by the vehicle of the first and second signals from the central station,

fourth means operative at the end of the particular time period for converting the operation of the vehicle from a powered and active state to a powered but inactive state when the vehicle fails to receive the first and second signals during the particular time period, and

fourth means responsive in the vehicle to the first and second signals received by the vehicle from the central station for operating the first and second motors in accordance with such first and second signals only when the first means [receiver] has received the same first and second signals from the central station a plurality of successive times.

Claim 46 (amended): In combination,

a plurality of [hand held] pads,

a plurality of vehicles,

each of the [handheld] pads providing first binary indications representing [a

5 selection] an address of any individual one of the vehicles and second binary indications representing individual operations to be provided by such vehicle,

a central station responsive to the first and second binary indications from the different pads [on a cyclic basis] for producing for each of the pads first signals providing an individual address for the individual one of the vehicles [selected] addressed by such  
10 pad and second signals providing commands for moving such vehicle in a particular direction and for operating such vehicle,

means responsive in each of the vehicles to the first signals addressing such vehicle from the central station and to the second signals from the central station for such vehicle for moving such vehicle and operating such vehicle in accordance with the  
15 commands provided by the central station to such vehicle, and

means operative in each of the vehicles for continuing to provide a movement of such vehicle for a particular period of time in accordance with the last commands addressed to such vehicle by the central station when the vehicle fails to receive any commands addressed to such vehicle during such particular period of time, and

*means in the central station for providing for the transmission of the address or commands to the vehicle from the central station only changes in the address or commands need to be sent from the address or commands previously provided in the pad.*

5      Claim 47 (amended): In a combination as set forth in claim 46,  
means in each of the vehicles for providing for an operation of such vehicle in  
[the] an inactive but powered state at the end of the particular period of time when such  
vehicle fails to receive any commands addressed to such vehicle during such particular  
period of time.

Claim 48 (amended): In a combination as set forth in claim 46,  
means responsive in each of the vehicles to the commands addressed to the  
vehicle relating to movements of the vehicle at a particular speed for accelerating the  
vehicle in progressive increments to the particular speed [to obtain such movements].

5      Claim 49 (amended): In combination,  
a plurality of [hand held] pads,  
a plurality of vehicles,  
each of the [handheld] pads providing first binary indications representing a  
selection of any individual one of the vehicles and second binary indications representing  
individual operations to be provided by such vehicle,

a central station responsive to the first and second binary indications from the different pads [on a cyclic basis] for producing for each of the pads first signals providing an individual address for [the] any individual one of the vehicles selected by such pad, the pads being connected to the central station,

each of the vehicles including a pair of left wheels spaced from each other in a longitudinal direction and a pair of right wheels spaced from each other in the longitudinal direction and including a first motor for moving the left wheels and a second motor for moving the right wheels,

the commands addressed to the vehicle from the central station including second signals for operating the first motor and third signals for operating the second motor,

first means in each of the vehicles for receiving the first, second and third signals addressed to such vehicle from the central station, and

second means responsive in each of the vehicles to the second and third signals received by the vehicle from the central station for [normally] accelerating the first and second motors in progressive increments to the speeds commanded by the central station to such motors for movement of such vehicle in the longitudinal direction.

Claim 50: In a combination as recited in claim 49,

third means responsive in each of the vehicles to the second and third signals received by such vehicle from the central station for movement of such vehicle in the

longitudinal direction for operating the first and second motors at the same speed, without  
5 any progressive increments in speed, when one of the motors in such vehicle has been  
previously operated at a different speed than the other motor in such vehicle, the same  
speed constituting the higher of the speeds provided by the first and second motors in  
such vehicle.

Claim 51 (amended): In a combination as set forth in claim [49] 50,  
means operative in each of the vehicles for continuing to operate the first and  
second motors for a particular period of time in accordance with the last ones of the  
second and third signals received by such vehicle from the central station when such  
5 vehicle fails to receive the second and third signals addressed to such vehicle during such  
particular period of time.

Claim 52 (amended): In combination,  
a plurality of [hand held] pads,  
a plurality of vehicles,  
each of the [hand held] pads providing first binary indications representing a  
5 selection of any individual one of the vehicles and second binary indications representing  
individual operations to be provided by such vehicles,

a central station responsive to the first and second binary indications from the different pads [on a cyclic basis] for producing for each of the pads first signals providing an individual address for [the] any individual one of the vehicles selected by such pad and  
10 second signals providing commands for moving such vehicle in a particular direction and for operating such vehicle,

first means in each of the vehicles for receiving the first and second signals from each of the pads,

second means responsive in each of the vehicles to the second signals addressed  
15 to such vehicle for determining whether successive ones of the second signals addressed to such vehicle [on the cyclic basis] are identical, and

third means in each of the vehicles for operating such vehicle in accordance with the second signals addressed to such vehicle when the second means in such vehicle determines that the successive ones of the second signals addressed to such vehicle [on  
20 the cyclic basis] are identical.

Claim 53 (amended): In a combination as set forth in claim 52,

the third means in each of the vehicles being operative to operate such vehicle in accordance with the second signals addressed to such vehicle in the second of the successive ones of the second signals addressed to such vehicle [on the cyclic basis] when



5 the second means in such vehicle determines that the successive ones of the second signals addressed to such vehicle [on the cyclic basis] are identical.

Claim 54 (amended): In a combination as set forth in claim 52,

the first and second signals for each of the vehicles being in the form of <sup>packets</sup> packets each having a first particular number of the first signals and a second particular number of the second signals,

5 fourth means for determining whether at least a particular percentage of the packets addressed to each of the vehicles has the first particular number of the first signals and the second particular number of the second signals in such packets during a particular period of time, and

10 fifth means for operating each of the vehicles in accordance with the second signals in the packets addressed to such vehicle when the fourth means in such vehicle determines that at least the particular percentage of the packets addressed to such vehicle during the particular period of time has the first particular number of the first signals and the second particular number of the second signals in the packets [during the particular period of time].

Claim 55 (amended): In combination,

a plurality of [hand held] pads,

a plurality of vehicles,

each of the [hand held] pads providing first binary indications representing [a

5 selection] an addressing of any individual one of the vehicles and second binary

indications representing individual operations to be provided by such addressed

vehicle[s],

a central station responsive to the first and second binary indications from the

different pads [on a cyclic basis] for producing for each of the pads [on the cyclic basis]

10 first signals providing an individual address for [the] any individual one of the vehicles

selected by such pad and second signals providing commands for moving such vehicle in

a particular direction and for operating such vehicle,

first means in each of the vehicles for receiving the first and second signals from

each of the pads,

15 the first and second signals for each of the vehicles being in the form of packets

each having a first particular number of the first signals and a second particular number

[member] of the second signals,

second means for determining whether at least a particular percentage of the

packets addressed to each of the vehicles during a particular period of time has the first

20 particular number of the second signals in each packet [during a particular period of time], and

third means for operating each of the vehicles in accordance with the second signals in the packets addressed to such vehicle when the [fourth] second means in each vehicle determines that at least the particular percentage of the packets addressed to such  
25 vehicle during the particular period of time has the second particular number of the second signals in the packets [during the particular period of time].

Claim 56 (amended): In a combination as set forth in claim 55,

the central station being operative to interrogate

each of the pads [on the cyclic basis] to determine the first and second binary indications from such pad[s], and

5 means in the central station for sending to the vehicles at each instant only the [second] binary indications representing changes in the addresses or commands from the pads at that instant.

Claim 61 (amended): In combination in a vehicle for use with a central station operative to receive, from a plurality of pads [on a cyclic basis], first binary indications representing the address of the vehicle and second binary indications representing operations to be performed by the vehicle and for sending first signals in accordance with

5 the first binary indications and second signals in accordance with the second binary indications,

first means in the vehicle for receiving the first and second signals from the central station in representation of the binary indications from each of the pads,

10 the first and second signals for the vehicle being in the form of packets each having a first particular number of the first signals and a second particular number of the second signals,

15 second means in the vehicle for determining whether at least a particular percentage of the packets addressed to the vehicle during a particular period of time has the second particular number of the second signals in such packets [during a particular period of time], and

20 third means in the vehicle for operating the vehicle in accordance with the second signals in the packets addressed to such vehicle when the second means in such vehicle determines that at least the particular percentage of the packets addressed to such vehicle during the particular period of time has the second particular number of the second signals in the packets [during the particular period of time].

Claim 62: In a combination as set forth in claim 61,

the vehicle including wheels and motors for rotating the wheels and including at least one member movable on the vehicle to perform selective functions,

the third means being responsive in the vehicle to the second signals for rotating  
5 the wheels in the vehicle to obtain a movement of the vehicle in accordance with such  
wheel rotations and for moving the member to perform the selective functions.

Claim 92 (amended): In combination for use with a plurality of vehicles each  
having an individual address and each operable when receiving the individual address,

a central station,

a plurality of pads each [manually] operable to address any individual one of the  
5 vehicles and each providing commands to operate the individual one of the vehicles,

each of the pads being connected to the central station for receiving power from  
the central station to provide first binary indications addressing [the] any individual one  
of the vehicles and second binary indications providing commands for operating the  
individual one of the vehicles,

10 first means in the central station for interrogating each of the pads, separately  
from the interrogations of the other pads, to determine the first and second binary  
indications from such pad,

second means in the pads for transmitting the first and second binary indications  
from the pads to the central station upon the interrogation of the pads by the central  
15 station,

third means in the central station for transmitting to the vehicles signals  
representing the first and second binary indications determined from each of the pads,  
the central station and the pads being constructed to provide for the connection of  
an additional pad to the central station,

20 the first means in the central station being operative to interrogate the pads in the  
plurality and the additional pad [upon] instantaneously after the connection of the  
additional pad to the central station,

the second means in the pads being operative to transmit the first and second  
binary indications from the pads in the plurality and the additional pad to the central  
25 station instantaneously after [upon] the connection of the additional pad to the central  
station, and

the third means in the central station being operative to transmit signals  
representing the first and second binary indications from the pads in the plurality and the  
additional pad to the vehicles in the plurality instantaneously after [upon] the connection  
30 of the additional pad to the central station.

Claim 93 (amended): In a combination as set forth in claim 92,

the first means being operative to interrogate the pads in the plurality on a cyclic  
basis before the connection of the additional pad to the central station and to interrogate

the pads in the plurality and the additional pad on the cyclic basis instantaneously after  
5 the connection of the additional pad to the central station.

Claim 94 (amended) In a combination as set forth in claim 92,  
the first means being operative to interrogate the pads in the plurality  
simultaneously before the connection of the additional pad to the central station and to  
interrogate simultaneously the pads in the plurality and the additional pad  
5 [simultaneously] instantaneously after the connection of the additional pad to the central  
station.

Claim 95 (amended): In a combination as set forth in claim 92,  
fourth means in each of the pads for providing for an illuminated indication in  
such pad of [the] any individual one of the vehicles addressed by such pad,

fifth means in the central station for providing in such pad an illumination  
5 indicating [the] any individual one of the vehicles addressed by such pad,

the fifth means in the central station being operative to continue the illumination  
of the vehicles addressed by the pads in the plurality and to provide an illumination of the  
vehicle addressed by the additional pad instantaneously after [when] the additional pad is  
connected to the central station.

Claim 100 (amended): In combination for use with a plurality of vehicles,  
a plurality of pads each operative to provide a first plurality of binary indications  
addressing any individual one of the vehicles and to provide a second plurality of binary  
indications providing commands to such individual one of the vehicles for operating such  
5 vehicle,

a central station,

the pads in the plurality being connected to the central station.

first means in the central station for interrogating the pads to determine the first  
and second binary indications from such pads,

10 second means in the pads for transmitting the first and second binary indications  
from the pads to the central station, and

third means responsive in the central station to the identities of the first binary  
indications in successive transmissions of the first and second binary indications from  
each individual one of the pads to the central station for transmitting to the vehicles  
15 signals representing the first and second binary indications for such pad [to the vehicles in  
the plurality],

fourth means in the central station for providing a transmittal by the second means  
at each instant only of the second binary indications from the pads which are providing  
changes in address or commands at that instant.



Claim 103 (amended): In a combination as set forth in claim 100,

the first means in the central station being operative to simultaneously interrogate the pads to obtain simultaneously from the pads the first binary indications providing the addresses for the individual ones of the vehicles and the second binary indications providing the commands for operating the individual ones of the vehicles.

Claim 107 (amended): In a combination as provided in claim 2[6]3,

the first means being operative to interrogate the pads [on a cyclic basis] in the plurality and the additional pad simultaneously, the second means being responsive to the simultaneous interrogation provided by the first means of the pads in the plurality and the additional pad for sending the addresses and commands to the addressed vehicles to obtain an operation of such vehicles in accordance with such commands.

Claim 108 (amended): In combination for use in a system including a plurality of vehicles each responsive to an individual address and to a plurality of commands for providing individual operations of vehicles in accordance with such commands,

a plurality of pads each operative to provide an address for selecting any individual one of the vehicles and to provide commands to such individual one of the

vehicles for operating such individual one of the vehicles in accordance with such commands,

a central station [connected to the pads] the pads being connected to the central station,

10 first means in the central station for interrogating the pads [on a cyclic basis] to determine the address and the commands provided by such pads,

second means responsive in the central station to the interrogation provided by the first means in the central station concerning the address and the commands from [such] each pad for receiving the address and the commands from such pad and for transmitting  
15 to the vehicles signals representing the address and the commands from such pad [to the vehicles in the plurality], and

third means responsive in the central station to any change in the address or commands from an individual one of the pads for transmitting the address and the commands from such pad to the vehicles in the plurality on a priority basis relative to the  
20 address and commands from the other pads in the plurality.

Claim 109 (amended): In a combination as set forth in claim 108 wherein the central station discontinues [the] an interrogation of any pad which is disconnected from the central station instantaneously after the pad is disconnected from  
the central station and wherein

5           the central station provides for the addressing by any of the pads still connected to  
the central station of the vehicle previously addressed by the disconnected pad.

Claim 110: In a combination as set forth in claim 108 wherein

the central station transmits the address and commands from the individual one of  
the pads in the plurality to the vehicles in the plurality only when the central station has  
completed the transmission to the vehicles in the plurality of the address and commands  
5 of the pad whose address and commands the central station has been transmitting at the  
time that the central station receives the change in the address and the commands from  
the individual one of the pads in the plurality.

Claim 111 (amended): In combination for use in a system including a plurality of  
vehicles each responsive to an individual address and to a plurality of commands for  
providing individual operations of vehicles in accordance with such commands,

a plurality of pads each operative to provide an address for selecting any  
5 individual one of the vehicles and to provide commands to such individual one of the  
vehicles for operating such individual one of the vehicles in accordance with such  
commands,

a central station [connected to the pads,] the pads being connected to the central  
station,

- 10 first means in the central station for interrogating the pads [on a cyclic basis] to  
determine the address and the commands provided by such pads,
- second means responsive in the central station to the interrogation provided by the  
first means in the central station concerning the address and the commands from such  
pads for receiving the address and the commands from such pads and for transmitting the  
15 address and the commands from such pads to the vehicles in the plurality, and
- third means responsive in the central station to the [coupling] connection of an  
individual one of the pads to the central station and to the reception by the [such] central  
station of the [an] address and commands from such individual one of the pads for  
transmitting such address and commands from such individual one of the pads on a  
20 priority basis relative to the transmission of the address and commands from the other  
ones of the pads.

Claim 112 (amended): In a combination as set forth in claim 111 wherein

the central station is operative to transmit [for transmitting] to the vehicles at each  
instant only the addresses and commands from the pads which are providing changes in  
addresses or commands at that instant.

Claim 113 (Amended): In a combination as set forth in claim 111 wherein

the central station transmits the address and commands from the [individual one of the] additional pad [stations in the plurality] to the vehicles in the plurality only when the central station has completed the transmission to the vehicles in the plurality of the address and commands of the pad in the plurality whose address and commands the central station has been transmitting to the vehicles at the time that the central station receives the address and the commands from the additional pad [individual one of the pads in the plurality].

Claim 122 (amended): In combination for use in a system including a plurality of vehicles each responsive to an individual address and to a plurality of commands for providing individual operations of the vehicles in accordance with such commands,

a plurality of pads each operative to provide an address for selecting any individual one of the vehicles and to provide commands to such individual one of the vehicles for operating such individual one of the vehicles in accordance with such commands,

a central station [connected to the pads], the pads being connected to the central station,

first means in the central station for interrogating the pads to determine the address and the commands provided by such pads,

second means responsive in the pads to the interrogation by the central station for transmitting the address and the commands from the pads to the central station,

third means in the central station for receiving the addresses and the commands transmitted by the pads to the central station, and

fourth means in the central station for transmitting to the vehicles in the plurality only the address and commands transmitted from each pad to the central station that are different from the immediately preceding address or commands transmitted from such pad to the central station.

Claim 123 (amended): In a combination as set forth in the claim 122,

the first means in the central station being operative to interrogate the pads simultaneously [on a cyclic basis] and the pads being operative to transmit the addresses and the commands from such pads to the central station when interrogated.

Claim 126 (amended): In combination,

a plurality of vehicles each having an individual address,

a plurality of pads each operative to provide an address for selecting any individual one of the vehicles and to provide commands to such individual one of the vehicles for operating such individual one of the vehicles in accordance with such commands,

a central station [connected to the pads], the pads being connected to the central station.

each of the pads being operative to transmit the address and the commands from  
10 such pad to the central station for transmission by the central station to the vehicles,

each individual one of the vehicles having a light for illumination when such  
vehicle is addressed and commanded by the central station as a result of the address and  
commands from an individual one of the pads,

first means in the central station for storing the addressing by each individual one  
15 of the pads of the individual one of the vehicles,

second means in the central station for communicating a command to the  
individual one of the vehicles to extinguish the light in such vehicle instantaneously after  
[when] the individual one of the pads providing the address and the commands to such  
individual one of the vehicles becomes disconnected from the central station, and

20 third means in each individual one of the vehicles for extinguishing the light in  
such individual one of the vehicles in accordance with the communication from the  
central station.

Claim 127 (amended): In a combination as set forth in claim 126,

fourth means in the central station for eliminating the storage of the addressing by each individual one of the pads of the individual one of the vehicles instantaneously after [when] such individual one of the pads becomes disconnected from the central station.

5

Claim 146 (amended): In combination for use with a plurality of pads each operative to provide an address and commands and a central station for transmitting at a particular frequency a carrier signal modulated with the addresses and commands from the pads,

a vehicle,

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means in the vehicle for receiving from the central station the carrier signals modulated with the address individual to such vehicle,

means for powering the vehicle in accordance with the reception by such vehicle of the modulated carrier signals individual to such vehicle,

15

means in the vehicle for demodulating the modulat[ing]ed carrier signals to recover the commands individual to such vehicle,

the vehicle including wheels for moving the vehicle and including motors for rotating the wheels,

means in the receiv[er]ing means for providing pulse width modulations for energizing the motors in the vehicle to move the vehicle, <sup>one of</sup> the pulse width modulations



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providing progressive increments of time <sup>in the pulse width</sup> for energizing the motors to accelerate the vehicle, and

means in the receiv[er] ing means for ~~(progressively)~~ energizing the motors with the

<sup>necessary and</sup> of <sup>the</sup> pulse with modulations for the progressive increments of time <sup>in the pulse width</sup> to accelerate the motors.

Claim 147 (Amended): In a combination as set forth in claim 146,

<sup>the width of the pulse widths</sup> the vehicle[s] being progressively <sup>increased</sup> energized with the pulse width modulations) for

the progressive increments of time from a zero time in the pulse width modulations to accelerate the motors in the vehicle.

5

Claim 154: In a combination as set forth in claim 108 wherein

the central station initiates an interrogation of any pad which is connected to the central station, instantaneously after the pad is connected to the central station, to determine if the pad has addressed any one of the vehicles not then being addressed by any of the other pads.

Claim 155: In combination for use with a plurality of vehicles each having an individual address and having members for moving the vehicles,

a central station,

a plurality of pads each operatively connected to the central station and each

5           operative to provide addresses individual to any one of such vehicles and to provide  
          commands for operating such vehicle,

          the central station being operative to receive the addresses and commands from  
          the pads and to transmit to the vehicles addresses and commands in packets each  
          composed of a plurality of binary indications representing the address and the commands  
10          for an individual one of the vehicles,

          means in the central station for transmitting the packets of the binary indications  
          to the vehicles,

          each of the pads including a switch actuatable a number of times to select any one  
          of the vehicles, the particular number of times being dependent upon the particular one of  
15          the vehicles to be addressed by the pad,

          memory means in the central station for remembering each of the vehicles  
          addressed at any instant and the pad addressing the vehicle, and

          means in the central station for preventing each of the pads from addressing one  
          of the vehicles already being addressed by another one of the pads.

          Claim 156 (Twice Amended): In combination for use with a plurality of  
          vehicles each having an individual address and having members for moving the vehicles,  
          a central station,  
          a plurality of pads each operatively connected to the central station and each

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from each of the pads to the vehicles in the plurality,

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addressed at any instant and the pad addressing the vehicle, and

of the vehicles already being addressed by another one of the pads,

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25 the preventing means in the central station being operable to prevent each pad  
from illuminating light illuminable members individual to vehicles being addressed by  
the other pads.

Claim 157. In combination for use with a plurality of vehicles each having an  
individual address and having members for moving the vehicles,

a central station,

5 a plurality of pads coupled to the central station, each of the pads having a first  
member actuatable a sequential number of times to address any one of the vehicles  
dependent upon the number of actuations and having second members actuatable to  
provide for a movement of the addressed vehicle,

10 means in the central station for interrogating the pads to determine the number of  
actuations of the first member in each of the pads and to determine the actuations of the  
second members in each of the pads,

means in the central station for providing for each of the pads first binary  
indications addressing the vehicle being selected by the pad and second binary indications  
relating to the movements to be provided in the vehicle,

15 means in the central station for remembering each pad and the vehicle selected by  
the pad and for providing for the transmittal of such information to the pads, and

means responsive in the pads to the remembered information transmitted to the pads from the central station for skipping in each pad the binary indications of vehicles already being addressed by others of the pads when the first member in the pad is actuated the sequential number of times.

Claim 159: In combination for use in a system including a plurality of vehicles each responsive to an individual address and to a plurality of commands for providing individual operations of such vehicles in accordance with such commands,

5 a plurality of pads, each individual one of the pads including a plurality of switches having first and second states of operation for providing an address to select any individual one of the vehicles and for providing commands to such individual one of the vehicles for operating such individual one of the vehicles in accordance with such commands,

10 a central station, the pads being connected to the central station for interrogation simultaneously by the central station concerning the states of operation of the switches in the pads,

first means responsive in the pads to the simultaneous interrogation by the central station of the states of operation of the switches in the pads for transmitting to the central station binary indications of such states of operation, and

15                   second means responsive in the central station to the binary indications of the  
states of operation of the switches in the pads for transmitting to the vehicles signals  
representing such binary indications.

                  Claim 160: In a combination as set forth in claim 159,  
                  the first means being responsive in the pads to the simultaneous interrogations by  
20                   the central station of the states of operation of the switches in the pads for simultaneously  
transmitting to the central station the binary indications of the states of operation of the  
switches in the pads in the plurality.

                  Claim 161: In a combination as set forth in claim 159,  
                  the second means being responsive in the central station to the simultaneous  
transmission to the central station of the binary indications of the states of operation of  
the switches in the pads in the plurality for transmitting to the vehicles in sequence the  
5                   signals representing such binary indications for the different pads in the plurality.

**REMARKS**

Applicant submitted an amendment under Rule 116 in the parent application. The Examiner refused to enter the proposed amendment on the grounds that (1) the amendment raised new issues that would require further consideration and/or search and (2) the amendment did not place the application in better form for appeal. Applicant has accordingly filed this continuation application and have included in this continuation application the claims that were rejected by the Examiner in the parent application. These include claims 23-29, 36-39, 45-56, 61, 62, 92-95, 100, 103, 107-113, 122, 123, 126, 127, 146, 147, 154-157 and 159-161.

A number of claims have been amended to correct informalities noted by applicant's attorney upon a further study of the claims. A number of the claims have been amended to provide a sharp distinction over the references cited by the Examiner. As now written, all of the claims are believed to be definite and to be allowable for certain important reasons over the cited references.

The following Remarks were included in an amendment filed July 8, 1999, under Rule 116 in the Parent application. These remarks are as appropriate and pertinent in this application as they were in the parent application.

Claims 61 , 62, 146 and 147 have been rejected under 35 U.S.C. 1029b) as being anticipated by Rosenhagen. All of these claims are allowable over Rosenhagen for certain important reasons.

Claim 61 is allowable over Rosenhagen for certain important reasons.

Rosenhagen does not disclose second means in a vehicle for determining whether at least a particular percentage of successive packets addressed to the vehicle during a particular period of time has a particular number of second signals in the packets. There is also no disclosure in Rosenhagen of third means in the vehicle for operating the vehicle in accordance with the second signals in the packets addressed to such vehicle when the second means in such vehicle determines that at least the particular percentage of the packets addressed to such vehicle during the particular period of time has the second particular number of the second signals in the packets. Claim 62 is allowable over Rosenhagen for the same reasons as claim 61 since it is dependent from claim 61.



Claim 146 is allowable over Rosenhagen for certain important reasons. For example, claim 146 recites means in the receiving means for providing pulse width modulations for energizing the motors in the vehicle to move the vehicle, the pulse width modulations providing progressive increments of time for energizing the motors to accelerate the vehicle. There is also a recitation in claim 146 of means in the receiving means for progressively energizing the motors with the pulse width modulations for the progressive increments of time to accelerate the motors. These features are not disclosed in Rosenhagen.

Although Rosenhagen recites pulse width modulations, they are produced for a different purpose than what is recited in claim 146. As disclosed by Rosenhagen in column 14, line 60, to page 15, line 7, the pulse width modulations are produced as a result of errors in steering between a desired value and an actual value. The pulse widths of the modulations are variable depending upon the magnitude of the error. If there is no error, a braking signal is produced in Rosenhagen to prevent any changes in steering. This is not the same as in applicant's system where the width of the pulse width modulations is increased to accelerate the motors for increasing the speed of movement of the vehicle. This is recited in claim 146.

Since claim 147 is dependent from claim 146, it is allowable over Rosenhagen for the same reasons as claim 146. Claim 147 is also allowable over Rosenhagen because it recites that the vehicle is progressively energized with the pulse width modulations for the progressive increments of time from a zero time in the pulse width modulations to accelerate the motors in the vehicle.

Claims 23 - 27, 107, 155, 157 and 159 - 161 have been rejected under 35 U.S.C. 1039a) as being unpatentable over Rosenhagen in view of Stern. According to the Examiner at the top of page 3 of the Office Action dated April 29, 1999:

***“Rosenhagen lacks a central station, such as is taught by Stern.***

***It would have been obvious to one of ordinary skill in the art to have provided a Rosenhagen set with a central station, as taught by stern [sic], in order to only require one transmitter, thereby saving on electronic costs.”***

When a vehicle in applicant's system fails to receive a command for a particular period of time from a pad addressing the vehicle or when the pad addressing the vehicle in applicant's system addresses another vehicle, the vehicle is released from the addressing pad and is available thereafter to be addressed by any of the pads including the

addressing pad. When the vehicle is released from being addressed by the pad addressing the vehicle or when the pad addresses another vehicle, the vehicle does not expend energy. This is different from Rosenhagen. As indicated by Rosenhagen in column 10, lines 24 - 32:

*“If a vehicle fails to receive a properly decodeable command signal in a predetermined period of time, suitably from about 0.5 to about 1.5 seconds, command decoder 18 produces a braking signal which brings toy vehicle 8 to a stop awaiting the receipt of a new command signal. This avoids toy vehicle 8 running away and becoming lost or damaged when the control signal is lost due to distance, malfunction or turning off control set 6.”*

Thus, in Rosenhagen, the toy vehicle is still addressed by the control set 6 previously addressing the toy vehicle. This prevents the toy vehicle 8 from being addressed by any of the other control sets. Furthermore, the toy vehicle 8 is expending energy in braking the vehicle.

Stern also cannot address a vehicle such as the vehicle 20 from any one of the control units 26. This results from the fact that the multi-channel FM telemetry oscillator

and mixer 38 receives signals representing an operation of a steering control 30 in each individual one of the control units 26. The multi-channel unit 38 converts the operation of the steering control 30 for each control unit 26 into control signals of an individual frequency tuned to an individual one of the vehicles on the track. Thus, each of the control units 26 in Stern can control the operation of only an individual one of the vehicles and cannot control the operation of any of the other vehicles.

In applicant's system, only one central station is provided. This central station transmits signals at the same frequency to all of the vehicles. The signals intended for each vehicle have a different binary address from the signals intended for the other vehicles. The signals are transmitted on a sequential basis by the central station to the different vehicles.

Stern does not provide a single central station. Stern provides a plurality of central stations each operating at an individual frequency to control the operation of an individual one of the vehicles. This may be seen from the discussion by Stern in column 3, lines 46 - 59, where Stern designates the apparatus 38 as a "*multi-channel FM telemetry network*". Stern happens to house the plurality of central stations in a single box 38. But housing the plurality of central stations in a single box 38 does not convert the plurality of central stations into a single central station.

As will be seen from the above discussion, Rosenhagen cannot address a vehicle from any one of a plurality of control pads. Neither can Stern. On this basis, applicant does not see how a person of ordinary skill in the art can combine Rosenhagen and Stern to obtain a system in which any one of a plurality of pads, operating through a single central station, controls the operation of any addressed one of a plurality of vehicles. Furthermore, a person of ordinary skill in the art cannot combine Rosenhagen and Stern to produce a system in which any one of a plurality of pads can control the operation of a vehicle.

Claim 23 recites a plurality of pads each operative to provide an address for selecting any individual one of a plurality of vehicles and to provide commands to such individual one of the vehicles for operating such individual one of the vehicles in accordance with such commands. As described in the immediately preceding paragraphs, neither Rosenhagen nor Stern has a plurality of pads each operative to provide an address for selecting any individual one of a plurality of vehicles.

Claim 23 is also allowable over the combination of Rosenhagen and Stern for several additional and important reasons. Neither Rosenhagen nor Stern discloses a central station. Furthermore, neither Rosenhagen nor Stern discloses first means in the central station for interrogating the pads to determine the address and commands

provided by the pads. There is also no disclosure in either Rosenhagen or Stern of second means responsive in the central station to the interrogation by the first means of each pad for sending the address and commands from the pad to the vehicle addressed by the pad to obtain an operation of such vehicle in accordance with such commands. No disclosure is further provided in either Rosenhagen or Stern that the first means in the central station is operative to interrogate any additional pad connected to the central station at the instant that such additional pad is connected to the central station. Neither Rosenhagen nor Stern additionally discloses that the second means is responsive in the central station to the interrogation provided by the first means in the central station to send signals representing the address and commands from each of the pads in the plurality and the additional pad to the vehicle addressed by such pad, instantaneously after the additional pad is connected to the central station, to obtain an operation of such vehicle in accordance with such commands without affecting the interrogation of the pads in the plurality by the central station.

Claims 24 and 25 are dependent from claim 23 and are accordingly allowable over the combination of Rosenhagen and Stern for the same reasons as claim 23. Claim 24 is additionally allowable over the combination of Rosenhagen and Stern because neither reference discloses third means in the central station for providing for the sending at each instant by the second means of only the commands from the pads which are

providing changes in addresses or commands at that instant. Claim 25 recites that the first means is operative to eliminate from interrogation by the central station of any one of the pads disconnected in the plurality from the central station and to provide such elimination at the instant that the pad is disconnected from the central station and without affecting the interrogation of the other pads by the central station and to provide for the addressing by any of the pads, other than the disconnected pad, of the vehicle previously addressed by the disconnected pad.

Claim 26 is allowable over the combination of Rosenhagen and Stern for substantially the same reasons as discussed above in connection with claim 23. However, claim 26 deals with the disconnection of one of the pads in a plurality from a central station without affecting the interrogation of the other pads in the plurality by the central station. Neither Rosenhagen nor Stern deals with such a situation.

Since claim 27 is dependent from claim 26, it is allowable over the combination of Rosenhagen and Stern for the same reasons as claim 26. Claim 27 is also allowable over the combination of Rosenhagen and Stern because of the recitation of third means in the central station for providing for the transmission at each instant by the second means only of the commands from the pads which are providing changes in addresses or commands at that instant.

Because of its dependency from claim 23, claim 107 is allowable over the combination of Rosenhagen and Stern for the same reasons as claim 23. Claim 107 is also allowable over the combination of Rosenhagen and Stern because Rosenhagen and Stern do not interrogate the pads. Since they do not interrogate the pads, they cannot interrogate the pads in the plurality and the additional pad simultaneously.

Claim 155 is allowable over the combination of Rosenhagen and Stern for certain important reasons. Neither reference discloses a central station. Furthermore, neither reference discloses a plurality of pads each operatively connected to the central station and each operative to provide addresses individual to any one of such vehicles and to provide commands for operating such vehicle. There is also disclosure in either Rosenhagen or Stern that each of the pads includes a switch actuatable a number of times to select any one of the vehicles, the particular number of times being dependent upon the particular one of the vehicles addressed by the pad. No disclosure is further provided in either of Rosenhagen or Stern of memory means in the central station for remembering each of the vehicles addressed at each instant and the pad addressing the vehicle. Neither of the references further discloses means in the central station for preventing each of the pads from addressing one of the vehicles already being addressed by another one of the pads.



Claim 157 recites a central station. It also recites that each of the pads in a plurality has a first member actuatable a sequential number of times to address any one of the vehicles dependent upon the number of actuations. The claim also recites the interrogation of the pads by the central station to determine the number of actuations of the first member in each of the pads. A recitation is also made in the claim of means in the central station for remembering each pad and the vehicle selected by the pad and for providing for the transmittal of such information to the pads. There is also a recitation in claim 157 of means responsive in the pads to the remembered information transmitted to the pads from the central station for skipping in each pad the binary indications of vehicles already being addressed by others of the pads when the first member in the pad is actuated the sequential number of times. None of the features specified in this paragraph is disclosed in either Rosenhagen or Stern.

Claim 159 recites that each individual one of the pads in a plurality includes switches for providing an address to select any individual one of a plurality of vehicles. There is also a recitation in the claim of a central station and that the pads are connected to the central station for interrogation simultaneously by the central station concerning the states of operation of the switches in the pads. The claim also recites that the pads sends switch information to the central station in response to the simultaneous

interrogation of the pads by the central station. These features are not disclosed in either Rosenhagen or Stern.

Because of their dependency from claim 159, claims 16 and 161 are allowable over the combination of Rosenhagen and Stern for the same reasons as claim 159. Claim 160 is additionally allowable over the combination of Rosenhagen and Stern because neither reference discloses that the first means is responsive to the simultaneous interrogations by the central station of the states of operation of the switches in the pads for transmitting to the central station the binary indications of the states of closure of the switches. Claim 161 is additionally allowable over the combination of Rosenhagen and Stern because of the recitation that the second means is responsive in the central station to the simultaneous transmission of the binary indications to the central station for transmitting to the vehicles in sequence the signals representing such binary indications.

Claims 28, 29, 36 - 39, 45 - 56, 92 - 95, 100, 103, 108 - 110, 122, 123, 126, 127 and 154 have been rejected under 35 U.S.C.(a) as being unpatentable over Yavetz in view of Stern. As will be seen from the discussion below, claims 28, 29, 36 - 39, 43 - 56, 92 - 95, 100, 103, 108 - 110, 122, 123, 126, 127 and 154 are allowable for certain important reasons over the combination of Yavetz and Stern.

As the Examiner has admitted, Yavetz does not disclose a central station. Neither does Stern as discussed in detail in paragraph 4 since Stern discloses a plurality of central stations, each having a different frequency, disposed within a single housing. On this basis, a person of ordinary skill in the art could not combine Yavetz and Stern to provide a system with a central station such as the central station provided by applicant. Except possibly for claims 43 - 45, all of the claims rejected on the combination of Yavetz and Stern recite a central station as a positive element in the claims and further recite the relationship between the central station and a pad or a plurality of pads where each pad operates through the central station to select any individual one of a plurality of vehicles. This is not disclosed in either Yavetz or Stern.

Applicant filed an Information Disclosure Statement in this application on or about May 7, 1998. The record indicates that the Examiner considered the prior art references in the Information Disclosure Statement on June 30, 1998. One of the prior art references listed in the Information Disclosure Statement is Nakada patent 5,452,401 issued on September 26, 1995. Nakada may be considered to disclose a central station in two (2) of the three (3) embodiments disclosed in his patent. In the embodiment shown in Figure 4, Nakada provides a plurality of passive toy units 1a, 1b, etc., a plurality of transmitters 3a, 3b, etc. and a synchronizing signal transmitting means 5 which may be considered to constitute a central station. The signal transmitting means 5 generates a synchronizing signal for

synchronizing the operation of the transmitters 3a, 3b, etc. and actuates a light transmitting element 21 to transmit a synchronizing signal of an infra red beam to the toy units 1a, 1b, etc. Each of the transmitters 3a, 3b, etc. transmits signals to one of the toy units 1a, 1b, etc. in synchronism with one of the synchronizing signals. One of the toy units 1a, 1b, etc. responds to the signal from the energized one of the transmitters 3a, 3b, etc. and the synchronizing signal from the synchronizing means 5.

In the embodiment shown in Figure 5 of Nakada, one (e.g. 3a) of the transmitters 3a, 3b, etc. is provided with a synchronizing signal transmitting means (e.g. the means 5 of Figure 4). The synchronizing signal transmitting means in this transmitter (e.g. 3a) is connected to the other transmitters (e.g. 3, 3b, etc.). It performs the same functions as the signal transmitting means 5 in the embodiment of Figure 4.

Thus, as late as September, 1995, Nakada provided a central station but not a central station of the type disclosed and claimed by applicant. The central station disclosed by Nakada was not as straight forward or advantageous as that provided by applicant since applicant's central station receives information from the pads and communicates this information directly to the vehicles or accessories. In this way, applicant's central station eliminates many of the duplications which exist in the pads when the pads communicate directly with the vehicles. For example, since applicant's central station provides power to

the pads, applicant's central station eliminates the need for providing power from individual power sources to each of the pads.

The Nakada patent issued after Stern and Yavetz. It was not obvious to Nakada, a person skilled in the art, to combine Stern and Yavetz to obtain the advantages of applicant's invention. If it was not obvious to Nakada, a skilled person, to do so, how would it be obvious to a person of ordinary skill in the art to do so?

There is another significant difference between applicant's invention and Nakada. The central station in Nakada does not interrogate the pads to determine the operation of the switches in the pads and the central station does not transmit to the vehicles signals based upon the interrogation of the pads. This is recited in claims 28, 29, 36 - 39, 46 - 56, 92 - 95, 100, 103, 108 - 110, 122, 123, 126, 127 and 154. These claims are distinguished over each of Yavetz and Stern for the same reasons as discussed in this paragraph as they are distinguished over Nakada.

There are in the prior art a number of references which disclose systems with a multiple number of transmitters and a multiple number of receivers. These include the following in addition to the references cited by applicant in the Information Disclosure Statement filed by applicant in the USPTO:

Hughson patent 3,482,046

Wrege patent 3,639,755

Simonelli patent 4,817,940

The system disclosed in these patents would have benefitted significantly from the inclusion of a central station. The failure of Nakada and the references cited in this paragraph to include a central station of applicant's type in these systems shows that it was not obvious to a person of ordinary skill in the art to provide a central station of the type disclosed and claimed by applicant.

Applicant notes that the Hughson patent issued in 1969. This shows that the unobviousness of a person of ordinary skill in the art to provide a central station of the type disclosed and claimed by applicant has existed for a period of approximately thirty (30) years. In that period, no one has provided a central station of the type disclosed and claimed by applicant. This unobviousness continued into the year 1995 when the Nakada patent

issued. Surely the existence of an unobviousness for a period of thirty (30) years negates any argument that the inclusion of a central station of the type disclosed and claimed by applicant would have been obvious to a person of ordinary skill in the art.

Claims 28 and 29 recite a switch operative to provide an address to any individual one of the vehicles dependent upon the number of the operations of the switch in a particular one of the first and second states. The Examiner appears to concede that none of the references including Yavetz and Stern discloses this. The Examiner appears to consider this, on page 3 of the Office Action dated April 29, 1999, *"an obvious choice of design well within the skill of one of ordinary skill in the art"*. The Examiner has cited scores of prior art references including the prior art references cited in the Information Disclosure Statement. None of these references discloses a single switch, such as recited by applicant, for addressing individual ones of a plurality of vehicles. Since none of these references discloses such a single switch, applicant respectfully submits that it would not have been obvious to provide such a switch in a system such as disclosed and claimed by applicant.

In addition to the reasons specified above in this paragraph 5 for the allowability of the claims over the combination of Yavetz and Stern, claims 28, 29, 36 - 39, 46 - 56, 92 - 95, 100, 103, 108 - 110, 122, 123, 126, 127 and 154 are individually allowable over the combination of Yavetz and Stern because neither reference discloses the following:

Claim 28 - There is no disclosure in either reference of means responsive in the central station to the operations in the second state of the second switches providing in a pair of the pads contradictory commands to the individual one of the vehicles for converting such contradictory commands to signals providing specialized commands different from the commands provided by the operation of the different ones of the second switches in such pads.

Claim 29 - Neither reference discloses the features specified above in claim 28. Neither reference further discloses means in the central station for providing at each instant only the commands from the pads which are providing changes in addresses or commands at that instant. There is also no disclosure in either reference of means in the central station for sending to the vehicles in the plurality only the commands provided by the last mentioned means in the central station.

Claim 36 - There is no disclosure in either reference of second means responsive in each vehicle to the same identity of the signals providing the commands in two (2) successive packets addressed to such vehicle by the



first means in the central station for operating such vehicle in accordance with the patterns of the signals in such packets.

Claims 37 and 38 - Because of their dependency from claim 36, claims 37 and 38 are allowable over the combination of Yavetz and Stern for the same reasons as claim 36. Furthermore, as described above, claim 37 recites that the central station interrogates the pads. Claim 38 additionally recites means in the central station for transmitting to the vehicles at each instant only the binary indications from the pads which are providing changes in addresses or commands at that instant. These features are not disclosed in either Yavetz or Stern.

Claim 46 - Neither Yavetz nor Stern discloses means operative in each of the vehicles for continuing to provide a movement of such vehicle for a particular period of time in accordance with the last commands addressed to such vehicle by the central station when the vehicle fails to receive any commands addressed to such vehicle during such particular period of time. Neither reference additionally discloses means operative in each of the vehicles for converting the vehicle from the powered and active state to the powered and inactive state at the end of the particular period of time when

such vehicle fails to receive any commands addressed to such vehicle during such particular period of time.

Claim 47 - Claim 47 is allowable over the combination of Yavetz and Stern for the same reasons as claim 46 because of its dependency from claim 46. Claim 47 also recites means in each of the vehicles for providing for a change in such vehicle from the inactive but powered state at the end of a second particular period of time when such vehicle fails to receive any commands addressed to such vehicle from the central station for any of the vehicles during such second particular period of time.

Claim 48 - Claim 48 is allowable over the combination of Yavetz and Stern for the same reasons as claim 46 since it is dependent from claim 46. Claim 48 additionally recites means responsive in each of the vehicles to the commands addressed to the vehicle relating to movements of the vehicle at a particular speed for accelerating the vehicle in progressive increments to the particular speed. This is not disclosed in either Yavetz or Stern.

Claim 49 - Neither Yavetz nor Stern discloses second means responsive in each of the vehicles to the second and third signals received by the vehicle from the central station for accelerating the first and second motors in progressive increments to the speeds commanded by the central station to such motors for movement of such vehicle in the longitudinal direction.

Claim 50 - Claim 50 is dependent from claim 49 and is accordingly allowable over the combination of Yavetz and Stern for the same reasons as claim 49. Claim 50 also recites third means responsive in each of the vehicles to the second and third signals received by such vehicle from the central station for movement of such vehicle in the longitudinal direction for operating the first and second motors at the same speed, without any progressive increments in speed, when one of the motors in such vehicle has been previously operated at a different speed than the other motor in such vehicle, the same speed constituting the higher of the speeds provided by the first and second motors in such vehicle.

Claim 51 - Since claim 51 is dependent from claim 50, it is allowable over the combination of references for the same reasons as claim 50. Claim 51 additionally recites means operative in each of the vehicles for continuing to operate the first and second motors for a particular period of time in accordance with the last ones of the second and third signals received by such vehicle from the central station when such vehicle fails to receive the second and third signals addressed to such vehicle during such particular period of time.

Claim 52 - Neither Yavetz nor Stern discloses second means responsive in each of the vehicles to the second signals addressed to such vehicle for determining whether successive ones of such vehicle for determining whether successive ones of the second signals addressed to such vehicle are identical and third means in each of the vehicles for operating such vehicle in accordance with the second signals addressed to such vehicle when the second means in such vehicle determines that the successive ones of the second signals addressed to such vehicle are identical.

Claim 53 - Claim 53 is dependent from claim 52 and is accordingly allowable over the combination of Yavetz and Stern for the same reasons as claim 52. There is an additional recitation in claim 53 that the third means in each of the vehicles is operative to operate such vehicle in accordance with the second signals addressed to such vehicle in the second of the successive ones of the second signals addressed to such vehicle when the second means in such vehicle determines that the successive ones of the second signals addressed to such vehicle are identical. This is not disclosed by either Yavetz or Ster.

Claim 54 - Because of its dependency from claim 52, claim 54 is allowable over the combination of Yavetz and Stern for the same reasons as claim 52. Claim 54 additionally recites fourth means for determining whether at least a particular percentage of the successive packets addressed to each of the vehicles has the first particular number of the first signals and the second particular number of the second signals during a particular period of time. There is also a recitation in claim 54 of fifth means for operating each of the vehicles in accordance with the second signals in the successive packets addressed to such vehicle when the fourth means in such vehicle determines that at least the particular percentage of the packets addressed to

such vehicle during the particular period of time has the first particular number of the first signals and the second particular number of the second signals in the packets.

Claim 55 - A recitation is made in claim 55 of second means for determining whether at least a particular percentage of the packets addressed to each of the vehicles during a particular period of time has the first particular number of the second signals in each packet. There is also a recitation in the claim of third means for operating each of the vehicles in accordance with the second signals in the successive packets addressed to such vehicle when the second means in each vehicle determines that at least the particular percentage of the packets addressed to such vehicle during the particular period of time has the second particular number of the second signals in the packets.

Claim 56 - Since claim 56 is dependent from claim 55, it is allowable over the combination of Yavetz and Stern for the same reasons as claim 55. Furthermore, in addition to the recitation of the interrogation of the pads by the central station, claim 56 recites means in the central station for sending to

the vehicles at each instant only the binary indications representing changes in the addresses or commands from the pad at that instant.

Claim 92 - The central station and the pads are constructed to provide for the connection of an additional pad to the central station. The first means in the central station are operative to interrogate the pads in the plurality and the additional pad instantaneously after the connection of the additional pad to the central station. The second means in the pad is operative to transmit the first and second binary indications from the pads in the plurality and the additional pad to the central station instantaneously after the connection of the additional pad to the central station. The third means in the central station is operative to transmit signals representing the first and second binary indications from the pads in the plurality and the additional pad to the vehicles in the plurality instantaneously after the connection of the additional pad to the central station. These features are not disclosed in either Yavetz or Stern.

Claims 93 and 94 - claims 93 and 94 are allowable over the combination of Yavetz and Stern for the same reasons as claim 92 because of their dependency from claim 92. Claim 93 additionally recites that the first

means are operative to interrogate the pads in the plurality before the connection of the additional pad to the central station and to interrogate the pads in the plurality and the additional pad instantaneously after the connection of the additional pad to the central station. Claim 93 additionally recites that the interrogation of the pads is on a cyclic basis. Claim 94 additionally recites that the interrogation of the pads in the plurality is simultaneous before the connection of the additional pad to the central station and that the interrogation of the pads in the plurality and the additional pad is simultaneous after the connection of the additional pad to the central station.

Claim 95 - Since claim 95 is dependent from claim 92, it is allowable over the combination of Yavetz and Stern for the same reasons as claim 92. Claim 95 additionally recites that the fifth means in the central station is operative to continue the illumination of the vehicles addressed by the pads in the plurality and to provide an illumination of the vehicle addressed by the additional pad immediately after the additional pad is connected to the central station.



Claim 100 - There is a recitation in claim 100 of fourth means in the central station for providing a transmittal by the second means at each instant only of the second binary indications from the pads which are providing changes in address or commands at that instant.

Claim 103 - Claim 103 is dependent from claim 100 and is accordingly allowable over the combination of Yavetz and Stern for the same reasons as claim 100. Claim 103 also recites that the first means in the central station is operative to simultaneously interrogate the pads to obtain simultaneously from the pads the first binary indications providing the addresses for the individual ones of the vehicles and the second binary indications providing the commands for operating the individual ones of the vehicles.

Claim 108 - There is no disclosure in either Yavetz or Stern of third means responsive in the central station to any change in the address or commands from an individual one of the pads for transmitting the address and the commands from such pad to the vehicle in the plurality on a priority basis relative to the address and commands from the other pads in the plurality.

Claim 122 - There is a recitation in claim 122 of fourth means in the central station for transmitting to the vehicles in the plurality only the address and commands transmitted from each pad to the central station that are different from the immediately preceding address or commands transmitted from such pad to the central station.

Claim 123 - Since claim 123 is dependent from claim 122, it is allowable over the combination of Yavetz and Stern for the same reasons as claim 122. An additional recitation is made in claim 123 that the first means in the central station is operative to interrogate the pads simultaneously and that the pads are operative to transmit the addresses and the commands from such pads to the central station when interrogated.

Claim 126 - Neither Yavetz nor Stern discloses that each individual one of the vehicles has a light for illumination when such vehicle is addressed and commanded by the central station as a result of the address and commands from an individual one of the pads. Neither reference additionally discloses first means in the central station for storing the addressing by each individual one of the pads of the individual one of the vehicles. There is also no disclosure in either reference of second means in the central station for

communicating a command to the individual one of the vehicles to extinguish the light in such vehicle instantaneously after the individual one of the pads providing the address and the commands to such individual one of the vehicles becomes disconnected from the central station. No disclosure is further provided in either reference of third means in each individual one of the vehicles for extinguishing the light in such individual one of the vehicles in accordance with the communication from the central station.

According to the Examiner in paragraph 6 of the Office Action, Yavetz provides in each vehicle lights indicating the identity of the vehicle. This is not true. It is true that Yavetz may be considered to provide an illumination of the vehicle. See column 7, lines 7 - 18, of the Yavetz specification. Yavetz provides this illumination in each vehicle every time that the LED 112 in the vehicle is activated by an electromagnetic signal fired by another vehicle to indicate a fire command signal from the controller 12. (Yavetz Abstract lines 13 - 17 and page 7, lines 7 - 37 of the Yavetz specification). However, this illumination in Yavetz does not identify the vehicle. Furthermore, the illumination occurs only at isolated instances and it does not occur when the vehicle is addressed. It would have been desirable in Yavetz to provide a visual indication identifying the vehicle being addressed at each instant, but Yavetz does not do so. Thus, Yavetz does not provide on each vehicle a light for indicating when such vehicle is addressed and commanded.

Yavetz should be considered as a person skilled in the art. The advantage of providing an illumination identifying the addressed vehicle was not obvious to Yavetz even though Yavetz provided at isolated instances another type of illumination in each vehicle. It was not obvious to Stern who would be considered as a person skilled in the art. This would indicate that it was not obvious to a person of ordinary skill in the art before applicant's invention to provide an illumination identifying the addressed vehicle. Claim 126 is accordingly allowable over the combination of Yavetz and Stern. This is particularly true since neither Yavetz nor Stern discloses a central station and neither Yavetz nor Stern extinguishes the light in a vehicle after the pad addressing the vehicle becomes disconnected from the central station.

Claim 127 - Because of its dependency from claim 126, claim 127 is allowable over the combination of Yavetz and Stern for the same reasons as claim 126. Claim 127 additionally recites fourth means in the central station for eliminating the storage of the addressing by each individual one of the pads of the individual one of the vehicles immediately after such individual one of the pads becomes disconnected from the central station.

Claim 154 - Since claim 154 is dependent from claim 108, it is allowable over the combination of Yavetz and Stern for the same reasons as claim 108. Claim 154 additionally recites that the central station initiates an interrogation of any pad which is connected to the central station, instantaneously after the pad is connected to the central station, to determine if the pad has addressed any one of the vehicles not then being addressed by any of the pads.

As previously indicated, claim 45 (unlike claims 28, 29, 36 - 39, 46 - 56, 92 - 95, 100, 103, 108 - 110, 122, 123, 126, 127 and 154) do not recite a central station in the body of the claims although the central station is recited in the preamble of the claims. Claim 45 (unlike claims 28, 29, 36 - 39, 46 - 56, 92 - 95, 100, 103, 108 - 110, 122, 123, 126, 127 and 154) also do not recite the interrogation of pads by the central station to determine the addressing and commands provided by the pads.

Claim 45 - Claim 45 is dependent from claim 43 and is accordingly allowable over the combination of Yavetz and Stern for the same reasons as claim 43. Claim 45 also recites fifth means responsive in the vehicle to the first and second signals received by the vehicle from the central station for operating the first and second motors in accordance with such first and second signals only when the first means has received the same first and second signals from the central station a plurality of successive times.

Claim 158 has been rejected under 35 U.S.C. 103(a) as being unpatentable over Rosenhagen in view of Stern as applied to claim 155 and 157 and further in view of Yavetz. Each of claims 156 and 158 is allowable over the combination of Rosenhagen, Stern and Yavetz for certain important reasons.

Claim 156 is allowable over the combination of Rosenhagen, Stern and Yavetz for a number of reasons including the following:

- a. None of the references discloses a central station.
- b. Since none of the references discloses a central station, none of the references discloses that the central station receives addresses and commands from the pads.
- c. None of the references discloses means in the central station for transmitting the packets of the binary indications from each of the pads to the vehicles in the plurality.
- d. There is no disclosure in any of the references that each of the pads includes a switch actuatable a number of times to select any one of the vehicles, the particular number of times being dependent upon the particular one of the vehicles to be addressed by the pad.
- e. No disclosure is provided in any of the references of memory means in the central station for remembering each of the vehicles addressed at any instant and the pad addressing the vehicle.

f. None of the references discloses means in the central station for preventing each of the pads from addressing one of the vehicles already being addressed by another one of the pads.

g. There is no disclosure in any of the references that the preventing means in the central station is operable to prevent each pad from illuminating light illuminable members individual to vehicles being addressed by the other pads.

Claims 111 - 113 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Yavetz in view of Stern and Rosenhagen. Claims 111 - 113 are allowable over each of Yavetz, Stern and Rosenhagen for a number of the same reasons. This prevents Yavetz, Stern and Rosenhagen from being combined to reject claims 111 - 113.

Claim 111 is allowable over the combination of Yavetz, Stern and Rosenhagen for a number of reasons including the following:

- a. None of the references discloses a central station.
- b. There is no disclosure in any of the references of first means in the central station for interrogating the pads to determine the address and the commands provided by the pads.
- c. None of the references discloses second means responsive in the central station to the interrogation provided by the first means in the central station concerning the address

and commands from the pads for receiving the address and commands from the pads and for transmitting the address and the commands from the pads to the vehicles in the plurality.

d. No disclosure is provided in any of the references of third means responsive in the central station to the connection of an additional pad, other than the pads in the plurality, to the central station and to the reception by the central station of the address and commands from such additional pad for initially transmitting such address and commands from such additional pad on a priority basis relative to the transmission of the address and commands from the pads in the plurality.

Since claim 112 is dependent from claim 111, it is allowable over the combination of Yavetz, Stern and Rosenhagen for the same reasons as claim 111. Claim 112 is also allowable over this combination of references because of the failure of any of the references to transmit to the vehicles at each instant only the addresses and commands from the pads which are providing changes in addresses or commands at that instant.

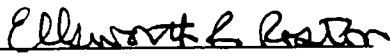
Claim 113 is allowable over the combination of Yavetz, Stern and Rosenhagen for the same reasons as claim 111 because it is dependent from claim 111. Claim 113 is additionally allowable over this combination of references because none of the references discloses that the central station transmits the address and commands from the additional pad to the vehicles in the plurality only when the central station has completed the



transmission to the vehicles in the plurality of the address and commands of the pads in the plurality whose address and commands the central station has been transmitting to the vehicles at the time that the central station receives the address and commands from the additional pad.

Reconsideration and allowance of the application are respectfully requested.

Respectfully submitted,

  
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Attorney for Applicants

ERR:dmc

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Please acknowledge receipt of our Continued Prosecution Application Under 37 C.F.R. § 1.53(d); Copies of the following from parent application Serial No. 08/797,188 filed February 11, 1997: specification (45 pgs); Claims (61 pgs); Declaration and Power of Attorney; (3 pgs); informal/formal drawings (10 pgs); and our check # 062763 in the amount of \$1352.00 to cover the requisite fees herewith by affixing hereon the Patent and Trademark Office stamp (including the serial number and filing date) and returning this card to our office.

Inventor(s): PETER C. DeANGELIS

Serial No. 08/797,188

Title: SYSTEM AND METHOD FOR CONTROLLING THE OPERATION OF TOYS

Mailed: August 13, 1999

[Express Mail No. [EL280119687US]

ERR:dmc

BOX CPA

Applicant: ROKENBOK TOY COMPANY

Docket No.: ROKEN-40907

Atty/Secy: ERR/dmc

Serial No.: 08/797,188

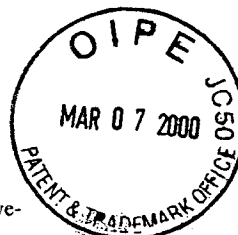
Filing Date: February 11, 1997

Title: SYSTEM AND METHOD FOR CONTROLLING THE OPERATION OF TOYS

Inventor(s): PETER C. DeANGELIS

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- ☒ Transmittal Letter (Duplicate/Triplicate)
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<b>TRANSMITTAL FORM</b>  (To be used for all correspondence after initial filing)	Application Number	08/797,188	
	Filing Date	February 11, 1997	
	First Named Inventor	Peter C. DeAngelis	
	Group Art Unit	3712	
	Examiner Name	D. Muir	
Total Number of Pages in This Submission	55	Attorney Docket Number	ROKEN-40907

## ENCLOSURES (check all that apply)

<input type="checkbox"/> Fee Transmittal Form <input type="checkbox"/> Fee Attached <input checked="" type="checkbox"/> Amendment/Response <input type="checkbox"/> After Final <input type="checkbox"/> Affidavits/declaration(s) <input type="checkbox"/> Extension of Time Request <input type="checkbox"/> Express Abandonment Request <input type="checkbox"/> Information Disclosure Statement <input type="checkbox"/> Certified Copy of Priority Document(s) <input type="checkbox"/> Response to Missing Parts/Incomplete Application <input type="checkbox"/> Response to Missing Parts under 37 CFR 1.52 or 1.53	<input type="checkbox"/> Assignment Papers (for an Application) <input type="checkbox"/> Drawing(s) <input type="checkbox"/> Licensing-related Papers <input type="checkbox"/> Petition Routing Slip (PTO/SB/69) and Accompanying Petition <input type="checkbox"/> To Convert a Provisional Application <input type="checkbox"/> Power of Attorney, Revocation Change of Correspondence Address <input type="checkbox"/> Terminal Disclaimer <input type="checkbox"/> Terminal Entity Statement <input type="checkbox"/> Request for Refund	<input type="checkbox"/> After Allowance Communication to Group <input type="checkbox"/> Appeal Communication to Board of Appeals and Interferences <input type="checkbox"/> Appeal Communication to Group (Appeal Notice, Brief, Reply Brief) <input type="checkbox"/> Proprietary Information <input type="checkbox"/> Status Letter <input checked="" type="checkbox"/> Additional Enclosure(s) (please identify below):  <b>Postcard</b>
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## SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm or Individual Name	FULWIDER PATTON LEE & UTECHT, LLP ELLSWORTH R. ROSTON, ESQ., REG. NO. 16,310
Signature	<i>Ellsworth R. Roston</i>
Date	FEBRUARY 29, 2000

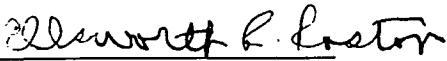
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of	)	Date: February 29, 2000
	)	
PETER C. DeANGELIS	)	Group No.: 3712
	)	
Serial No.: 08/797,188	)	Examiner: D. Muir
	)	
Filed: February 11, 1997	)	Docket No.: ROKEN-40907
	)	
For: SYSTEM AND METHOD FOR	)	Los Angeles, California 90024
CONTROLLING THE	)	
OPERATION OF TOYS	)	[147026.6]

AMENDMENT

BOX NON-FEE  
Assistant Commissioner for Patents  
Washington, D.C. 20231

Sir:

This is in response to the Office Action dated December 29, 1999. Please amend  
the above-identified patent application as follows:

**IN THE CLAIMS:**

Cancel claims 21, 155, 156, and 157.

Claim 6 (Twice Amended): In combination for controlling the operation of an individual one of a plurality of vehicles,

a first pad included in a plurality of pads and including a first switch operable in a pattern providing an address of the individual one of the plurality of vehicles and  
5 including a plurality of switches individually operable in a pattern providing for operations of the individual one of the vehicles in accordance with the pattern of operations of such switches,

means in the first pad for providing a plurality of light indications each for a particular one of the vehicles in the plurality,

10 means in the first pad for providing first light indications for the vehicles in the plurality when such first pad has not provided an address for any of the vehicles in the plurality,

means in the first pad for providing a second illumination for the individual one of the vehicles when the first pad provides the address for such individual one of the  
15 vehicles, and

the first pad including an additional switch having first and second states of operation and operative in the first state to provide for the operation of the individual one of the vehicles only by the first pad and operative in the second state to provide for [an] the operation of the individual one of the vehicles only by another one of the pads in the plurality in addition to the first pad.

Claim 9 (Twice Amended): Line 10, before "pads" insert -- the --;

line 12, before "pads" insert -- the --.

Claim 20 (Twice Amended): In combination for use with a central station and a plurality of vehicles for selecting and operating individual ones of the vehicles in accordance with addresses and commands provided by the central station,

a pad in a plurality of pads,

a first switch in the pad, the first switch having first and second states and operable on a repetitive basis to the second state for a particular number of times to select an individual one of the vehicles to be addressed by the [central station] pad,

a plurality of additional switches in the pad, the additional switches having first and second states and operable to the second state in a particular pattern to obtain the operation of the individual one of the vehicles in accordance with the pattern of operation of the additional switches in the second state,



a plurality of light indications in the pad, each of the light indications being associated with a different one of the vehicles in the plurality,

means for energizing the light indications in sequence in accordance with the sequential operations of the first switch in the pad to the second state to select the individual one of the vehicles in the plurality,

means for continuously energizing the individual one of the light indications associated with the individual one of the vehicles when the first switch in the pad has been operated to the second state on the sequential basis for the particular number of times to select the individual one of the vehicles to be addressed by the central station, [and]

means for skipping the energizing of the light indications associated with the vehicles addressed by the pads in the plurality other than the pad when the first switch in the [other] pad is operated on the repetitive basis to address the individual one of the vehicles[.], and

means in the pad for providing for the addressing of the individual one of the vehicles by another one of the pads in the plurality in addition to the addressing of the individual one of the vehicles by the pad.

Claim 25 (Twice Amended): Line 3, before "any" insert -- of --.

Claim 30 (Twice Amended): Line 17, before "signals" insert – first –.

Claim 45 (Twice Amended): [In a combination as set first in [Exhibit] claim 43]

In combination for use in a vehicle for moving the vehicle in accordance with commands  
which are provided by a pad to control the movements of the vehicle and which are  
converted by a central station to commands addressed by the central station to the vehicle  
5 to obtain the movements of the vehicle,

a pair of left wheels in the vehicle, the left wheels being spaced from each other in  
a longitudinal direction,

a pair of right wheels in the vehicle, the right wheels having the same spacing in  
the longitudinal direction as the left wheels,

10 a first motor in the vehicle for moving the left wheels in the vehicle in the  
longitudinal direction,

a second motor in the vehicle for moving the right wheels in the vehicle in the  
longitudinal direction,

15 the commands addressed to the vehicle from the central station including first  
signals for operating the first motor and second signals for operating the second motor,

first means in the vehicle for receiving the commands addressed to the vehicle from the central station,

second means responsive in the vehicle to the first and second signals received by the vehicle from the central station for operating the first and second motors in accordance with such signals,

the vehicle being operative in a powered and active state and in a powered and inactive state,

third means responsive in the vehicle to the failure of the vehicle in the powered and active state to receive the first and second signals for a particular period of time for maintaining the same operation of the first and second motors for such particular period of time as the operation of the motors upon the last reception by the vehicle of the first and second signals from the central station,

fourth means operative at the end of the particular time period for converting the operation of the vehicle from a powered and active state to a powered but inactive state when the vehicle fails to receive the first and second signals during the particular time period, and

fifth means responsive in the vehicle to the first and second signals received by the vehicle from the central station for operating the first and second motors in accordance with such first and second signals only when the first means has received the same first and second signals from the central station a plurality of successive times.

Claim 46 (Twice Amended): In combination,

a plurality of pads,

a plurality of vehicles,

each of the pads providing first binary indications representing an address of any

5 individual one of the vehicles and second binary indications representing individual operations to be provided by such vehicle,

a central station responsive to the first and second binary indications from the different pads for producing for each of the pads first signals providing an individual address for the individual one of the vehicles addressed by such pad and second signals  
10 providing commands for moving such vehicle in a particular direction and for operating such vehicle,

means responsive in each of the vehicles to the first signals addressing such vehicle from the central station and to the second signals from the central station for such vehicle for moving such vehicle and operating such vehicle in accordance with the  
15 commands provided by the central station to such vehicle,

means operative in each of the vehicles for continuing to provide a movement of such vehicle for a particular period of time in accordance with the last commands addressed to such vehicle by the central station when the vehicle fails to receive any commands addressed to such vehicle during such particular period of time, and

20           means in the central station for providing for the transmittal to the vehicles from  
the central station only of changes in the address or commands in each of the pads from  
the address or commands previously provided in the pad.

          Claim 47 (Twice Amended): In a combination as set forth in claim 46,  
means in each of the vehicles for converting the vehicle to an inactive but  
powered state when the vehicle fails to receive any commands from the central station for  
the particular period of time, and

5           means in each of the vehicles for providing for a change in such vehicle from the  
inactive but powered state to a depowered state at the end of a second particular period of  
time when such vehicle fails to receive any commands addressed to such vehicle from the  
central station for any of the pads during such second particular period of time.

          Claim 49 (Twice Amended): In combination,  
a plurality of pads,  
a plurality of vehicles,  
each of the pads providing first binary indications representing a selection of any  
5 individual one of the vehicles and second binary indications representing individual  
operations to be provided by such vehicle,

10 a central station responsive to the first and second binary indications from the  
different pads for producing for each of the pads first signals providing an individual  
address for any individual one of the vehicles selected by such pad, the pads being  
connected to the central station,

each of the vehicles including a pair of left wheels spaced from each other in a  
longitudinal direction and a pair of right wheels spaced from each other in the  
longitudinal direction and including a first motor for moving the left wheels and a second  
motor for moving the right wheels,

15 the commands addressed to the vehicle from the central station including second  
signals for operating the first motor and third signals for operating the second motor,

first means in each of the vehicles for receiving the first, second and third signals  
addressed to such vehicle from the central station, [and]

20 second means responsive in each of the vehicles to the second and third signals  
received by the vehicle from the central station for accelerating the first and second  
motors in progressive increments to the speeds commanded by the central station to such  
motors for movement of such vehicle in the longitudinal direction, and

25 third means responsive in each of the vehicles to the second and third signals  
received by such vehicle from the central station for operating the first and second motors  
at the same speed without any increment in speed when one of the motors in such vehicle  
has been previously operated at a different speed than the other motor in such vehicle, the

same speed constituting the higher of the speeds provided by the first and second motors in such vehicle.

Claim 54 (Twice Amended): Line 2, before “packets” insert – successive –.

Claim 55 (Twice Amended): Line 19, before “packets” insert – successive –;  
line 23, before “packets” insert – successive –.

Claim 111 (Twice Amended): In combination for use in a system including a plurality of vehicles each responsive to an individual address and to a plurality of commands for providing individual operations of vehicles in accordance with such commands,

5           a plurality of pads each operative to provide an address for selecting any individual one of the vehicles and to provide commands to such individual one of the vehicles for operating such individual one of the vehicles in accordance with such commands,

          a central station the pads being connected to the central station,

10           first means in the central station for interrogating the pads to determine the address and the commands provided by such pads,

second means responsive in the central station to the interrogation provided by the first means in the central station concerning the address and the commands from such pads for receiving the address and the commands from such pads and for transmitting the address and the commands from such pads to the vehicles in the plurality, and

third means responsive in the central station to the connection of an additional pad, other than the pads in the plurality, to the central station and to the reception by the central station of the address and commands from such additional pad for initially transmitting such address and commands from such additional pad [to the vehicles] on a priority basis relative to the transmission of the address and commands from the [other ones of the] pads in the plurality [to the vehicles].

Claim 146 (Twice Amended): In combination for use with a plurality of pads each operative to provide an address and commands and a central station for transmitting at a particular frequency a carrier signal modulated with the addresses and commands from the pads,

a vehicle,

means in the vehicle for receiving from the central station the carrier signals modulated with the address individual to such vehicle,

means for powering the vehicle in accordance with the reception by such vehicle of the modulated carrier signals individual to such vehicle,



10 means in the vehicle for demodulating the modulated carrier signals to recover the  
commands individual to such vehicle,

the vehicle including wheels for moving the vehicle and including motors for  
rotating the wheels,

means in the receiving means for providing pulse width modulations for  
15 energizing the motors in the vehicle to move the vehicle, successive ones of the pulse  
width modulations providing progressive increments of time in the pulse widths for  
energizing the motors to accelerate the vehicle, and

means in the receiving means for [progressively] energizing the motors with the  
successive ones of the pulse width modulations for the progressive increments of time in  
20 the pulse widths to accelerate the motors.

Claim 147 (Twice Amended): In a combination as set forth in claim 146,  
the widths of the pulse widths [vehicle] being progressively [energized with the  
pulse width modulations] incremented for the progressive increments of time from a zero  
time in the pulse widths [modulations] to accelerate the motors in the vehicle.

REMARKS

1. In an Office Action dated 4/29/99 in the parent application, the Examiner issued a final rejection. In the Office Action, the Examiner allowed claims 1-13, 18-22, 30, 32-35, 40-42, 57-60, 63-80, 82-91, 96-99, 104-106, 124, 125, 148, 149, 152, 153 and 162-164. The Examiner objected to the wording of claims 101, 102 and 128 and indicated that the claims would be allowable if rewritten in independent form to include all of the limitations of the base claim and any intervening claims. The Examiner rejected the other claims in the parent application on the basis of prior art.

In response to the Office Action dated 4/29/99 in the parent application, applicant filed a proposed amendment under Rule 116 on 7/12/99, and then first and second supplemental amendments under Rule 116. The second proposed supplemental amendment under Rule 116 was filed on July 29, 1999.

In an Advisory Action dated 8/10/99, the Examiner indicated that the Examiner would not enter the proposed amendments filed under Rule 116 in response to the final rejection filed 7/12/99, but would continue to allow claims 1-13, 18-22, 30, 32-35, 40-42, 57-60, 63-80, 82-91, 96-99, 104-106, 124-125, 148, 149, 152, 153 and 162-164 and would continue to object to claims 101, 102 and 128.

In response to the Advisory Action dated 8/10/99 in the parent application, applicant filed a third proposed supplemental amendment under Rule 116 in the parent application on August 20, 1999. In this proposed supplemental amendment, applicant retained only allowed claims 1-13, 18-22, 30, 32-35, 40-42, 57-60, 63-80, 82-91, 96-99, 104-106, 124, 125, 148, 149, 152, 153 and 162-164 and rewrote claims 101, 102 and 128 in independent form to include all of the limitations of the base claim and any intervening claims. Applicant made minor cosmetic changes in claims 18, 70 and 85 to correct informalities noted by applicant's attorney in these claims. The third supplemental amendment was filed to obtain an allowance of the parent application.

On August 19, 1999, applicant filed a continued prosecution application and a preliminary amendment in the continued prosecution. In the preliminary amendment, applicant included the claims which were finally rejected by the Examiner in the parent application. The claims filed in the continued prosecution application claims were included in the preliminary amendment in the amended form in which they were presented in the amendment filed under Rule 116 on July 19, 1999, in the parent application. These included claims 23-29, 36-39, 45-56, 61, 62, 92-95, 100, 103, 107-113, 122, 123, 126, 127, 147, 154-157 and 159-161.

In an Office Action dated 12/29/99 in the continued prosecution application, the Examiner rejected claims 1-13, 18-30, 32-113, 122-128, 146-149 and 152-164 as anticipated by Crane patent 5,944,609. The Examiner also cited of record Barton et al. patent 5,888,135. The Crane and Barton patents are assigned of record to the assignee of record of this continued prosecution application. As will be seen, the Office Action by the Examiner in the continued prosecution application included the rejection of the claims which were allowed in the parent application and which, on the basis of the retention of the claims in the parent application, were not officially in this continued prosecution application.

It is important for the record to show in this continued prosecution application that all of the claims rejected in this continued prosecution application as anticipated by Crane and retained in this amendment should be specifically indicated in the record in this continued prosecution application to be allowable over Crane. Applicant has accordingly prepared this amendment in this continued prosecution application in response to the Office Action dated 12/29/99 on the basis that claims 1-13, 18 -30, 32- 113, 122-128, 146-149 and 152-164 are considered to be included in this continued prosecution application prior to the preparation of this amendment. In this amendment, applicant has canceled claims 21, 43, and 155-158 so that claims 1-13, 18-20, 22-30, 32-42, 44-113, 122-128, 146-149, 152-154 and 159-164 are considered to be still included in

the continued prosecution application after the filing of this amendment. Some of these claims have been amended in minor respects to correct informalities noted by applicant's attorney upon a further study of the claims. As now written, the claims are believed to be definite. Other claims have been amended to provide a sharpened patentable distinction over Crane patent 5,944,609.

2. Claims 1-13, 18-20, 22-30, 32-42, 44-113, 122-128, 146-149, 152-154 and 159-164 have been rejected under various sections of 35 U.S.C. § 102 as being clearly anticipated by Crane. Applicant notes that the Crane patent has been assigned of record to the assignee of record of this application. When applicant's attorney wrote the claims in the parent application, applicant's attorney had the Crane patent in mind and wrote the claims specifically to avoid the Crane patent. As the Examiner will note from the subsequent discussion analyzing each claim individually with respect to Crane, the claims remaining in the application actually do distinguish patentably over Crane.

The Examiner appears to have indicated on page 2 of the Office Action that Crane discloses a central station, pads interrogated by the central station and lights on the vehicles and the pads. Applicant admits that the Crane patent and this continued prosecution also disclose a central station, pads interrogated by the central station and the disposition of lights on the vehicles and the pads. However, this application discloses a

system which is considerably more advanced and sophisticated than the Crane system. These advances are recited in the claims, as seen from the following discussion which specifies for each claim the recited features that are not disclosed by Crane:

Claim 1. Allowable over Crane in the recitation in lines 12-17 and the recitation in lines 19-21. Crane does not disclose a system in which a vehicle can be operated simultaneously by two (2) different pads.

Claim 2. Allowable over Crane because it is dependent from claim 1.

Claim 3. Allowable over Crane because it is dependent from claim 2. Also allowable over Crane because it recites in lines 2-11 additional details for the control in the operation of the vehicle by two (2) different pads.

Claim 4. Allowable over Crane because it recites in lines 11-16 and in lines 17-22 the simultaneous control in the operation of the vehicle by two (2) different pads.

Claim 5. Allowable over Crane because it is dependent from claim 4.

Also allowable over Crane because it recites in lines 2-7, lines 8-11 and lines 12-18 the simultaneous control in the operation of the vehicle by two (2) different pads.

Claim 6. Allowable over Crane because it recites in lines 16-19 the inclusion of an additional switch in the vehicle for providing in a first state of the switch for the operation of the vehicle by the first pad and in a second state of the switch for providing for the simultaneous operation of the vehicle by the first pad and another pad.

Claim 7: Allowable over Crane because it is dependent from claim 6.

Claim 8. Allowable over Crane because it is dependent from claim 6.

Claim 9. Allowable over Crane because it recites (a) in lines 8-10 the simultaneous control over the operation of a vehicle by two (2) pads when the commands from the pads are complementary and (b) in lines 12-15 the ignoring by the vehicle of the commands from the two (2) pads when the commands are contradictory.

Claim 10. Allowable over Crane because it is dependent from claim 9.

Also allowable over Crane because it recites in lines 2-4 means responsive in the vehicle

to the discontinuance of one of the pads in addressing the vehicle for continuing the response of the vehicle to the addresses and commands from the other one of the pads.

Claim 11. Allowable over Crane in the recitation in lines 12-16 that each of the pads includes a switch operable in a first state to provide for an operation of the vehicle by only one pad and operable in a second state to provide for an operation of the vehicle simultaneously by the one pad and another pad.

Claim 12. Allowable over Crane because it is dependent from claim 11.

Claim 13. Allowable over Crane because it is dependent from claim 12.  
Also allowable over Crane in the recitation in lines 7-9 that the central station is operable to send the vehicles only changes in the addresses and commands from the pads relative to the addresses and commands previously sent by the pads to the vehicles.

Claim 18. Allowable over Crane in the recitation in lines 14-20 of an additional switch operable in a pad to select a vehicle previously selected by the pad, as a result of the storage in the memory of the identification of the previously selected vehicle, after the pad has selected another vehicle.



Claim 19. Allowable over Crane because it is dependent from claim 18.

Claim 20. Allowable over Crane in the recitation in lines 25-27 of the operation of a vehicle by two (2) pads.

Claim 22. Allowable over Crane because it is dependent from claim 20.

Claim 23. Allowable over Crane in the recitation in lines 16-18 and 19-25 of means in the central station for interrogating an additional pad at the instant of the connection of such additional pad to the central station and for sending the signals from the additional pad to the vehicle addressed by such additional pad instantaneously after the additional pad is connected to the central station. In effect, the central station gives a priority to the additional pad when the additional pad is connected to the central station.

Claim 24. Allowable over Crane because it is dependent from claim 23.

Also allowable over Crane in the recitation in lines 2-4 of third means in the central station for providing for the sending at each instant by the second means of only the commands from the pads which are providing changes in addresses or commands at that instant.

Claim 25. Allowable over Crane because it is dependent from claim 23.

Also allowable over Crane in the recitation in lines 2-7 that the central station gives priority to the elimination of the interrogation of a pad by the central station at the instant that the pad is disconnected from the central station.

Claim 26. Allowable over Crane in the recitation in lines 17-22 that the central station eliminates from interrogation by the central station of any pad disconnected from the central station at the instant that the pad is disconnected from the central station.

Claim 27. Allowable over Crane because of its dependency from claim 26. Also allowable over Crane because of the recitation in lines 2-4 of third means in the central station for providing for the transmission at each instant by the second means only of the commands from the pads which are providing changes in addresses or commands at that instant.

Claim 28. Allowable over Crane because it recites in lines 16-21 means responsive in the central station to contradictory commands from a pair of pads for converting such commands to signals providing specialized commands different from the contradictory commands provided by the pads.

Claim 29. Allowable over Crane because it is dependent from claim 28.

Also allowable over Crane because it recites in lines 2-3 means in the central station for providing at each instant only the commands from the pads which are providing changes in addresses or commands at that instant.

Claim 30. Allowable over Crane because of (a) the recitation in line 9 that the central station provides start signals at a particular rate and (b) in the recitation in lines 14-18 of means responsive in each of the vehicles to the start signals from the central station for determining the particular rate of occurrence of the start signals and for providing for the response of the vehicle, at the particular rate of occurrence of the start signals, to first signals representing the individual address of the vehicle and to second signals providing commands for the vehicle.

Claim 32. Allowable over Crane because it is dependent from claim 30.

Also allowable over Crane because it recites in lines 2-5 that the central station is operative in a second mode to provide for the addressing of each individual one of the vehicles by at least two (2) pads.

Claim 33. Allowable over Crane in the recitation (a) in lines 21-22 of third means in the central station for providing a plurality of start signals at a particular

rate and (b) in lines 23-27 of fourth means responsive in each of the vehicles to the start signals at the particular rate for operating upon first signals in each of the pads at the particular rate to identify the address individual to such vehicle and for operating upon second signals at the particular rate to identify the commands related to the address individual to such vehicle.

Claim 34. Allowable over Crane because of its dependency from claim 33. Also allowable over Crane in the recitation in lines 2-5 of sixth means associated in the central station with the second means for providing for the transmittal to the vehicles by the second means at each instant only of the signals representing changes in addresses or commands from the pads at that instant.

Claim 35. Allowable over Crane because it is dependent from claim 33. Also allowable over Crane because it recites in lines 2-6 that each of the pads includes an additional switch providing in a second state of operation for addressing of a vehicle by the pad and at least another one of the pads.

Claim 36. Allowable over Crane in the recitation in lines 11-14 of second means responsive in each vehicle to the same identity of the signals providing the

commands in two (2) successive packets addressed to the vehicle by the central station for operating such vehicle in accordance with the patterns of the signals in such packets.

Claim 37. Allowable over Crane because it is dependent from claim 36.

Claim 38. Allowable over Crane because of its dependency from claim 36. Also allowable over Crane because of the recitation in lines 2-4 of means in the central station for transmitting at each instant only the binary indications from the pads which are providing changes in addresses or commands at that instant.

Claim 39. Allowable over Crane because of its dependency from claim 38. Also allowable over Crane because of the recitation in lines 2-5 of means in the central station for simultaneously interrogating the pads to obtain simultaneous binary indications from the pads of the individual ones of the vehicles addressed by such pads and the binary indications providing the commands for operating the individual ones of the pads. Crane discloses only a cyclic interrogation of the pads by the central station and only a cyclic response of the pads to the cyclic interrogations by the central station.

Claim 40. Allowable over Crane in the recitation in lines 21-26 that the first and second motors operate at the same speed, without any progressive increments in

speed, when one of the motors has been previously operated at a different speed than the other motor, the same speed constituting the higher of the speeds provided by the first and second motors.

Claim 41. Allowable over Crane because it is dependent from claim 40. Also allowable over Crane in the recitation (a) in lines 2-6 of fourth means responsive in the vehicle to the first and second signals received by the vehicle from the central station for converting the first and second signals to pulse width modulations in progressive instants of time, the pulse width modulations for each of the first and second motors at each instant having duty cycles dependent upon the speed at which such motor is to be operated at that instant and (b) in the recitation in lines 7-9 that the operation of the second and third means at each instant is dependent upon such pulse width modulations at that instant and the duty cycles of the pulse width modulations at that instant.

Claim 42. Allowable over Crane because it is dependent from claim 40.

Claim 44. Allowable over Crane because it is dependent from claim 45. Additionally allowable over Crane in the recitation in lines 2-5 of sixth means responsive in the vehicle to the first and second signals received by the vehicle from the central station for accelerating the first and second motors in progressive increments to the

speeds commanded by the central station to such motors for movement of the vehicle in the longitudinal direction.

Claim 45. Allowable over Crane in the recitation in lines 24-27 of fifth means responsive in the vehicle to the first and second signals received by the vehicle from the central station for operating the first and second motors in accordance with such first and second signals only when the first means has received the same first and second signals from the central station a plurality of successive times.

Claim 46. Allowable over Crane in the recitation in lines 20-22 of means in the central station for providing for the transmittal to the vehicle from the central station only of changes in the address or commands in each of the pads from the address or commands previously provided in the pad.

Claim 47. Allowable over Crane because its dependent from claim 46.

Claim 48. Allowable over Crane because it is dependent from claim 46.  
Also allowable over Crane in the recitation in lines 2-4 of means responsive in each of the vehicles to the commands addressed to the vehicle relating to movements of the vehicle at

a particular speed for accelerating the vehicle in progressive increments to the particular speed.

Claim 49. Allowable over Crane in the recitation in lines 19-22 of second means responsive in each of the vehicles to the second and third signals received by the vehicle from the central station for accelerating the first and second motors in progressive increments to the speeds commanded by the central station to such motors for movement of the vehicle in the longitudinal direction. Also allowable over Crane in the recitation in lines 23-28 of third means responsive in each of the vehicles to the second and third signals received by the vehicle from the central station for operating the first and second motors at the same speed when one of the motors in the vehicle has been previously operated at a different speed than the other motor in the vehicle, the same speed constituting the higher of the speeds provided by the first and second motors in the vehicle.

Claim 50. Allowable over Crane because it is dependent from claim 49. Also allowable over Crane in the recitation in lines 2-8 of third means responsive in each of the vehicles to the second and third signals received by such vehicle from the central station for movement of each vehicle in the longitudinal direction for operating the first and second motors at the same speed, without any progressive increments in speed, when



one of the motors in such vehicle has been previously operated at a different speed than the other motor in such vehicle, the same speed constituting the higher of the speeds provided by the first and second motors in such vehicle.

Claim 51. Allowable over Crane because it is dependent from claim 49.

Claim 52. Allowable over Crane in the recitation in lines 14-16 of second means responsive in each of the vehicles to the second signals addressed to such vehicle for determining whether successive ones of the second signals addressed to such vehicle are identical and in the recitation in lines 17-20 of third means in each of the vehicles for operating such vehicle in accordance with the second signals addressed to such vehicle when the second means in such vehicle determines that the successive ones of the second signals addressed to such vehicle are identical.

Claim 53. Allowable over Crane because it is dependent from claim 52.

Also allowable over Crane in the recitation in lines 2-6 that the third means in each of the vehicles is operative to operate such vehicle in accordance with the second signals addressed to such vehicle in the second of the successive ones of the second signals addressed to such vehicle when the second means in such vehicle determines that the successive ones of the second signals addressed to such vehicle are identical.

Claim 54. Allowable over Crane because it is dependent from claim 52.

Also allowable over Crane in the recitation of the fourth means in lines 11-14 and in the recitation of the fifth means in lines 15-20. The fourth and fifth means provide for the operation of a vehicle when it is determined that at least a particular percentage of the successive packets addressed to the vehicle during a particular time period has a first number of first signals and a second particular number of second signals.

Claim 55. Allowable over Crane in the recitation of the second means in lines 17-20 and in the recitation of the third means in lines 21-25. See the discussion in claim 54 for the significance of the second means and the third means.

Claim 56. Allowable over Crane because it is dependent from claim 55. Also allowable over Crane in the recitation in lines 5-7 of means in the central station for sending to the vehicles at each instant only the binary indications representing changes in the addresses or commands from the pads at that instant.

Claim 57. Allowable over Crane in the recitation of the second means in lines 9-10 and the third means in lines 11-14.

Claim 58. Allowable over Crane because it is dependent from claim 57.

Also allowable over Crane in the recitation of the operation of the third means in lines 4-9 in operating the vehicle when the second means in the vehicle determines that the successive ones of the second signals addressed to the vehicle are identical.

Claim 59. Allowable over Crane because it is dependent from claim 57.

Claim 60. Allowable over Crane because it is dependent from claim 57.

Also allowable over Crane in the recitation of the sixth means in lines 5-7 and the seventh means in lines 8-12. See the discussion relating to claim 54.

Claim 61. Allowable over Crane in the recitation of the second means in lines 12-15 and the third means in lines 16-20. See the discussion relating to claim 54.

Claim 62. Allowable over Crane because it is dependent from claim 61.

Claim 63. Allowable over Crane in the recitation of the first line in lines 9-11, the recitation of the second plurality of lines in lines 12-15 and the recitation of the third plurality of lines in lines 16-19.

Claim 64. Allowable over Crane because it is dependent from claim 63.

Also allowable over Crane in reciting in lines 2-4 additional details for the second lines and in lines 5-7 additional details for the third lines.

Claim 65. Allowable over Crane because it is dependent from claim 63.

Also allowable over Crane because of the recitation of additional details of the second lines in lines 2-4 and the third lines in lines 5-6.

Claim 66. Allowable over Crane because it is dependent from claim 63.

Also allowable over Crane because of the recitation in lines 3-5 that the interrogation of the pads in the plurality by the central station occurs when the clock signals on the lines in the second plurality have a particular one of the first and second polarities.

Claim 67. Allowable over Crane in the recitation in lines 8-10 of the first

line, in lines 11-14 of a second plurality of lines and in lines 15-18 and lines 19-22 of a third plurality of lines.

Claim 68. Allowable over Crane because it is dependent from claim 67.

Also allowable over Crane because it recites in lines 2-4 that the second lines in the plurality introduce the clock signals in sequence to the different ones of the pads on a

cyclic basis to obtain an interrogation of the pads by the central station when the pads receive the clock signals.

Claim 69. Allowable over Crane because it is dependent from claim 67.  
Also allowable over Crane in the recitation in lines 2-4 of the simultaneous introduction of the clock signals by the lines in the second plurality to the different pads to obtain a simultaneous interrogation of the different pads by the central station.

Claim 70. Allowable over Crane because it is dependent from claim 69.  
Also allowable over Crane in the recitation in lines 3-5 and 6-10 of the functions respectively performed in the first and second polarities of the clock signals.

Claim 71. Allowable over Crane in the recitation of a first line in lines 8-10, a plurality of second lines in lines 11-14 and a plurality of third lines in lines 15-16.

Claim 72. Allowable over Crane because it is dependent from claim 71.  
Also allowable over Crane in the recitation in lines 3-7 of additional functions for the third lines.

Claim 73. Allowable over Crane because it is dependent from claim 72.

Also allowable over Crane in the recitation in lines 2-4 of additional functions for the second lines and in lines 5-8 of additional functions for the third lines.

Claim 74. Allowable over Crane because it is dependent from claim 71.

Claim 75. Allowable over Crane because it is dependent from claim 72.

Also allowable over Crane in the recitation in lines 2-4 of additional functions for the second lines and in lines 5-8 of additional functions for the third lines. See also claim 70 concerning the simultaneous introduction of the clock signals by the second lines to the different pads. Lines 5-8 also recite a simultaneous introduction of signals.

Claim 76. Allowable over Crane in the recitation of a first line in lines 8-10, a plurality of second lines in lines 11-14, a plurality of third lines in lines 15-19 and an extension of the third line in lines 19-22.

Claim 77. Allowable over Crane because it is dependent from claim 76.

Also allowable over Crane in reciting in lines 4-9 additional functions for the extension of the third lines.

Claim 78. Allowable over Crane because it is dependent from claim 76.

Also allowable over Crane because of the recitation in lines 2-11 of additional functions for the extensions of the third lines between the central stations and the pads.

Claim 79. Allowable over Crane because it is dependent from claim 77.

Also allowable over Crane because of the recitation in lines 2-11 of additional functions for the extensions of the third lines between the central station and the pads.

Claim 80. Allowable over Crane in the recitation of a first line in lines 8-10, a plurality of second lines in lines 11-14, a plurality of third lines in lines 15-18 and extensions of the third lines in lines 19-28.

Claim 81. Allowable over Crane because it is dependent from claim 80.

Also allowable over Crane because it recites in lines 2-9 of additional functions for the extensions of the third lines between the central station and the pads.

Claim 82. Allowable over Crane in the recitation in lines 8-10 of a first line, in the recitation in lines 11-13 of a second line, in lines 14-16 of a third line and in lines 18-20 of second means.

Claim 83. Allowable over Crane because it is dependent from claim 82.

Also allowable over Crane in the recitation in lines 2-3 that the first means stores the first and second binary indications in the pad in a parallel form and is the recitation in lines 4-5 that the second means transfers the binary indications in the first means to the third line in a serial form.

Claim 84. Allowable over Crane because it is dependent from claim 82.

Also allowable over Crane in the recitation in lines 2-4 of additional functions of the first line, in the recitation in lines 5-6 that the central station provides through the first line to the pad signals identifying the vehicle selected by the pad and in the recitation in lines 7-9 that the central station provides identifying signals to the pad in synchronism with the clock signals on the second line during the time that a second voltage different from the first voltage is produced on the first line.

Claim 85. Allowable over Crane because it is dependent from claim 84.

Claim 86. Allowable over Crane in the recitation in lines 8-10 of the first line, in lines 11-12 of a second line, in line 15-18 of second means operative during the production of the first voltage on the first line for performing the recited function and in



lines 19-22 of third means operative during the production of the second voltage on the first line for performing the recited function.

Claim 87. Allowable over Crane because it is dependent from claim 86.

Claim 88. Allowable over Crane in (a) the recitation in lines 16-19 of the disconnection of a particular pad from the central station, (b) the recitation in lines 20-22 of the interrogation of the other pads by the central station, without any interrogation of the particular pad, instantaneously after the disconnection of the particular pad, (c) the recitation in lines 23-26 of the transmission from the other pads to the central station, without any transmission of indications from the particular pad to the central station, instantaneously after the disconnection of the particular pad from the central stations, (d) the recitation in lines 27-31 of the third means and (e) the recitation in lines 33-38 of the fourth means.

Claim 89. Allowable over Crane because it is dependent from claim 88.

Also allowable over Crane in the recitation in lines 2-5 that the first means is operative to interrogate the pads, other than the disconnected pad, instantaneously after the disconnection of the pad from the central station.

Claim 90. Allowable over Crane because it is dependent from claim 88.

Also allowable over Crane in the recitation in lines 2-6 of the simultaneous interrogation of the pads in the plurality before the disconnection of the particular one of the pads from the central station and the interrogation of the pads, other than the particular one of the pads, simultaneously and instantaneously after the disconnection of the particular one of the pads from the central station.

Claim 91. Allowable over Crane because it is dependent from claim 88.

Also allowable over Crane in the recitation in lines 7-9 of the seventh means and in lines 10-12 of the eighth means.

Claim 92. Allowable over Crane in the recitation in lines 19-21 of the first means, in lines 22-24 of the second means and in lines 25-28 of the third means.

Claim 93. Allowable over Crane because it is dependent from claim 92.

Also allowable over Crane in the recitation in lines 2-6 that the first means is operative to interrogate the pads in the plurality and the additional pad instantaneously after the connection of the additional pad to the central station.

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In re application of: PETER C. DeANGELIS

Serial No. 08/797,188

Title: SYSTEM AND METHOD FOR CONTROLLING THE OPERATION OF TOYS

Filed: February 11, 1997

**Due: August 23, 2000**

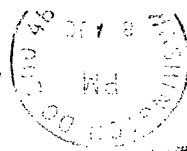
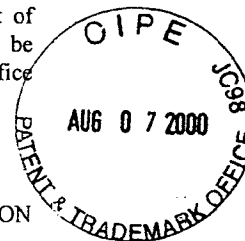
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	Filing Date	March 13, 2000	
	First Named Inventor	Peter C. DeAngelis	
	Group Art Unit	3712	
	Examiner Name	D. Muir	
Total Number of Pages in This Submission		Attorney Docket Number	ROKEN-45036

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APPLICATION NO.	FILING DATE	TOTAL CLAIMS	EXAMINER AND GROUP ART UNIT	DATE MAILED
06/797,188	04/11/97	176	MUIR, D	05/23/00
First Named Applicant	DEANGELIS,	35 USC 154(b) term ext. =	0 Days.	

TITLE OF INVENTION SYSTEM AND METHOD FOR CONTROLLING THE OPERATION OF TOYS

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(Authorized Signature)

Ellsworth R. Roston

(Date)

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Patent and Trademark Office, U.S. DEPARTMENT OF COMMERCE

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re application of:

Inventor(s): PETER C. DeANGELIS

Application No. 08/797,188

Filed: February 11, 1997

For: SYSTEM AND METHOD FOR  
CONTROLLING THE OPERATION OF  
TOYS

Date: August 2, 2000

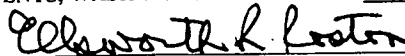
Examiner: D. Muir

Issue Batch No. M90

Not. of Allowance: August 23, 2000

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**BOX ISSUE FEE, ASSISTANT COMMISSIONER FOR PATENTS, WASHINGTON D.C. 20231 on August 2, 2000.**

  
Ellsworth R. Roston, Reg. No. 16,310  
Attorney for Applicant

**TRANSMITTAL OF FORMAL DRAWINGS**

BOX ISSUE FEE

Attn: Official Draftsperson

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Washington, D.C. 20231


Dear Sir or Madam:

In response to the NOTICE OF ALLOWABILITY mailed on May 23, 2000, please find attached:

- ☒ Ten (10) sheets of formal drawings for this application. Each sheet of drawings indicates the identifying indicia suggested in § 1.84(c) on the reverse side of the drawing.
- ☒ A copy of the NOTICE OF ALLOWABILITY (dated May 23, 2000).

Respectfully submitted,

FULWIDER PATTON LEE & UTECHT, LLP

By   
Ellsworth R. Roston, Reg. No. 16,310

Howard Hughes Center  
6060 Center Drive, Tenth Floor  
Los Angeles, California 90045  
Telephone: (310) 824-5555  
Facsimile: (310) 824-9696



<h1 style="margin: 0;">FEE TRANSMITTAL</h1> <h2 style="margin: 0;">for FY 2000</h2> <p style="font-size: small; margin: 0;">Patent fees are subject to annual revision. Small Entity payments <u>must</u> be supported by a small entity statement, otherwise large entity fees must be paid. See Forms PTO/SB/09-12. See 37 C.F.R. §§ 1.27 and 1.28.</p>		<p><b>Complete if Known</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">Application Number</td> <td>08/797,188</td> </tr> <tr> <td>Filing Date</td> <td>March 13, 2000</td> </tr> <tr> <td>First Named Inventor</td> <td>Peter C. DeAngelis</td> </tr> <tr> <td>Examiner Name</td> <td>D. Muir</td> </tr> <tr> <td>Group / Art Unit</td> <td>3712</td> </tr> <tr> <td>Attorney Docket No.</td> <td>ROKEN-40907</td> </tr> </table>		Application Number	08/797,188	Filing Date	March 13, 2000	First Named Inventor	Peter C. DeAngelis	Examiner Name	D. Muir	Group / Art Unit	3712	Attorney Docket No.	ROKEN-40907
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TOTAL AMOUNT OF PAYMENT	(\$ ) 605.00														

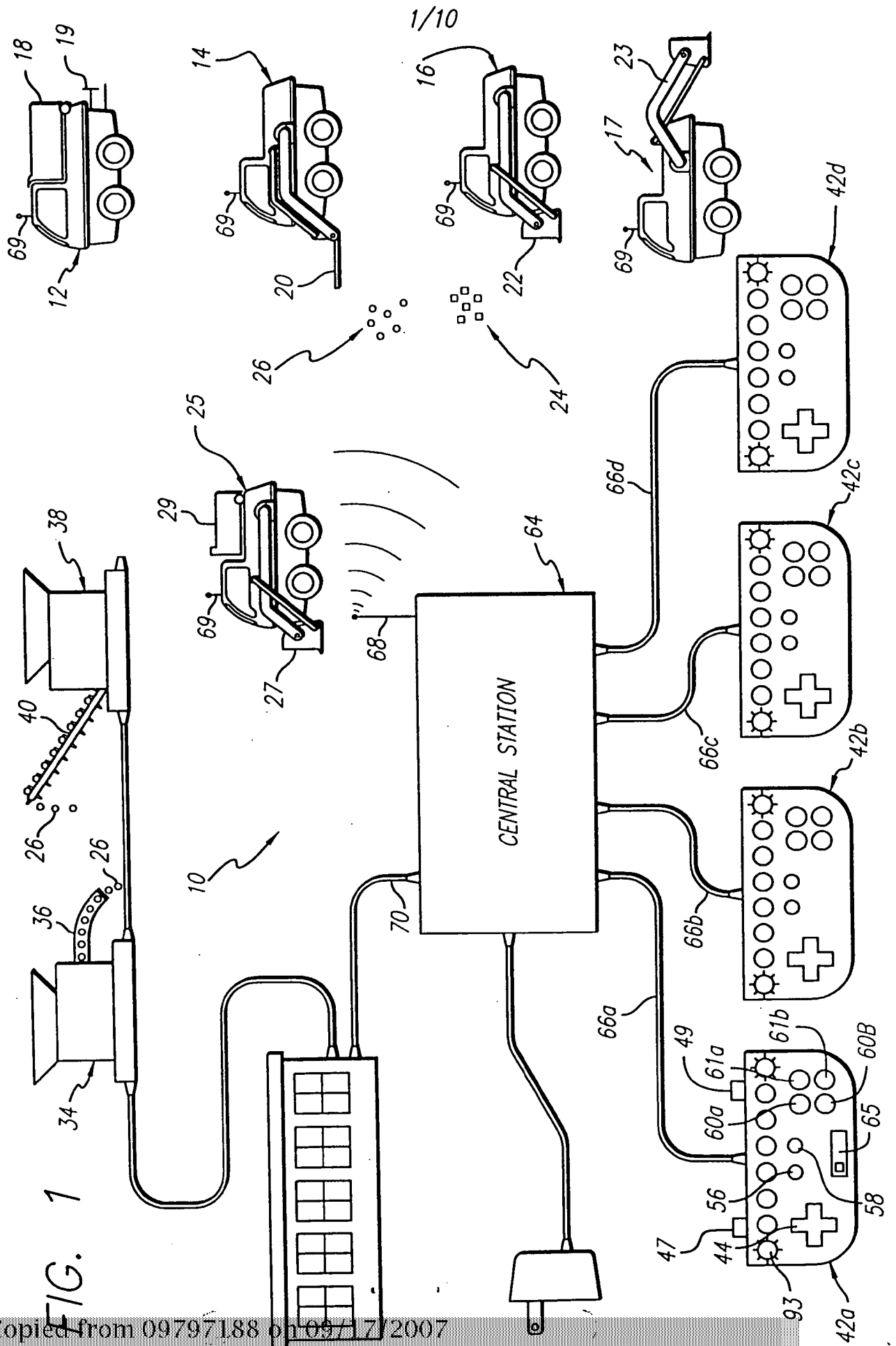
<p><b>METHOD OF PAYMENT (check one)</b></p> <p>1. <input checked="" type="checkbox"/> The Commissioner is hereby authorized to charge indicated fees and credit any overpayments to:</p> <p>Deposit Account Number: <b>06-2425</b></p> <p>Deposit Account Name: <b>FULWIDER PATTON, et al.</b></p> <p><input checked="" type="checkbox"/> Charge Any Additional Fee Required Under 37 CFR §§ 1.16 and 1.17</p> <p>2. <input checked="" type="checkbox"/> Payment Enclosed:  <input checked="" type="checkbox"/> Check    <input type="checkbox"/> Money Order    <input type="checkbox"/> Other</p> <p style="text-align: center;"><b>FEE CALCULATION</b></p> <p><b>1. BASIC FILING FEE</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Large Entity Fee Code (\$)</th> <th>Small Entity Fee Code (\$)</th> <th>Fee Description</th> <th>Fee Paid</th> </tr> </thead> <tbody> <tr><td>101 690</td><td>201 345</td><td>Utility filing fee</td><td></td></tr> <tr><td>106 310</td><td>206 155</td><td>Design filing fee</td><td></td></tr> <tr><td>107 480</td><td>207 240</td><td>Plant filing fee</td><td></td></tr> <tr><td>108 690</td><td>208 345</td><td>Reissue filing fee</td><td></td></tr> <tr><td>114 150</td><td>214 75</td><td>Provisional filing fee</td><td></td></tr> <tr> <td colspan="3" style="text-align: right;"><b>SUBTOTAL (1)</b></td> <td><b>(\$ )</b></td> </tr> </tbody> </table> <p><b>2. 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<b>SUBMITTED BY</b>		<b>Complete (if applicable)</b>	
Name (Print/Type)	ELLSWORTH R. ROSTON	Registration No. (Attorney/Agent)	16,310
Signature	<i>Ellsworth R. Roston</i>	Telephone	310-824-5555
		Date	8-2-00

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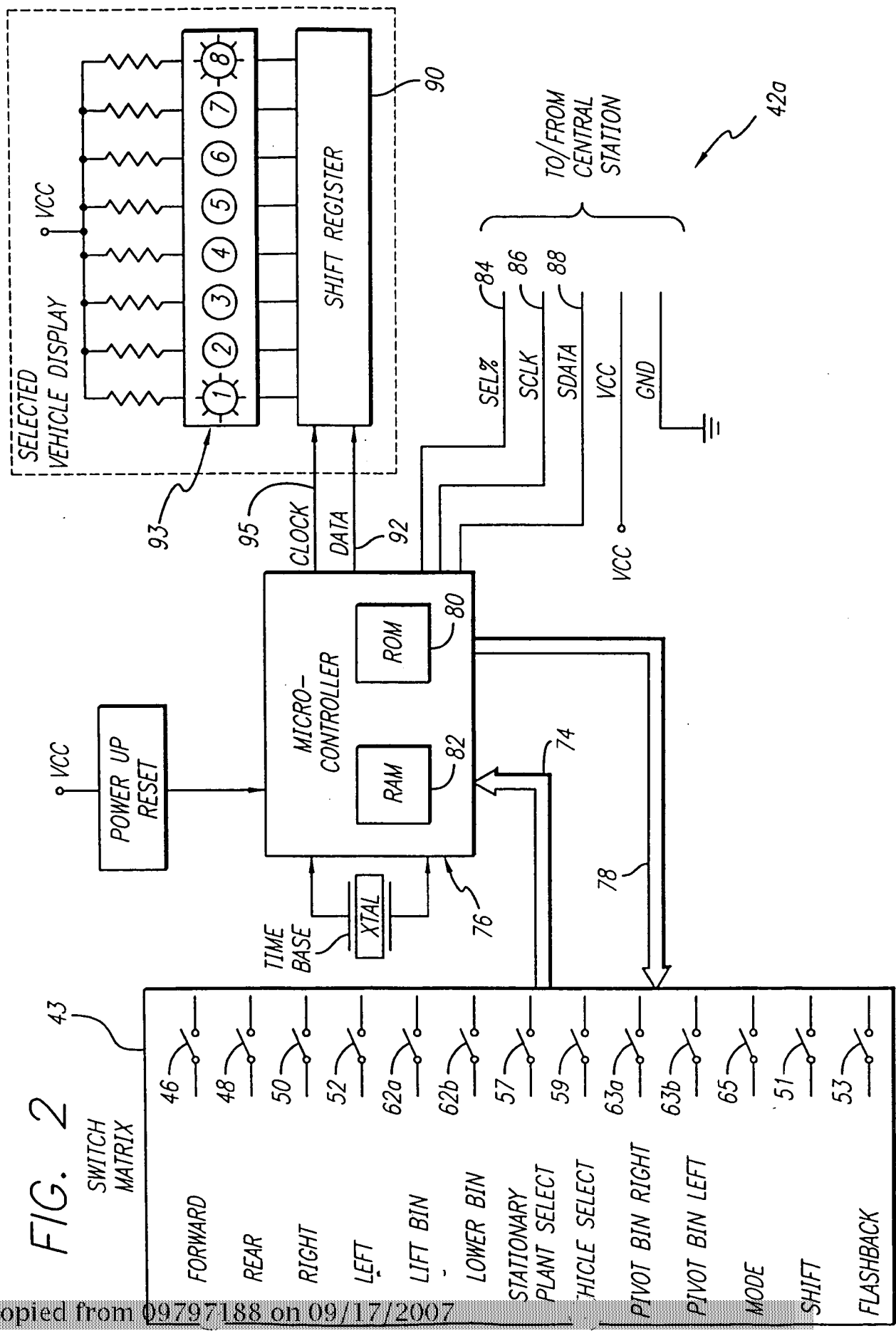


FIG. 3

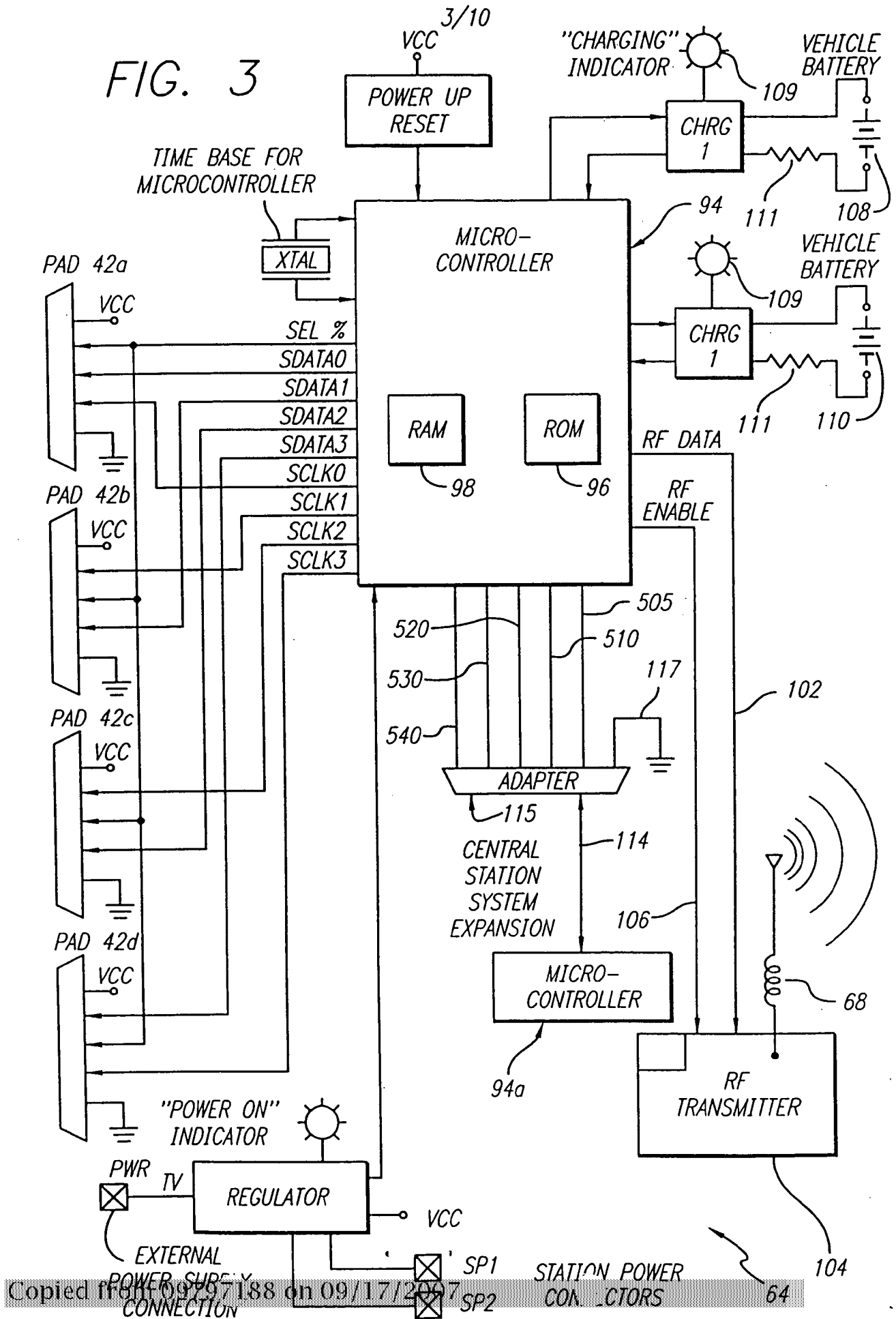


FIG. 4

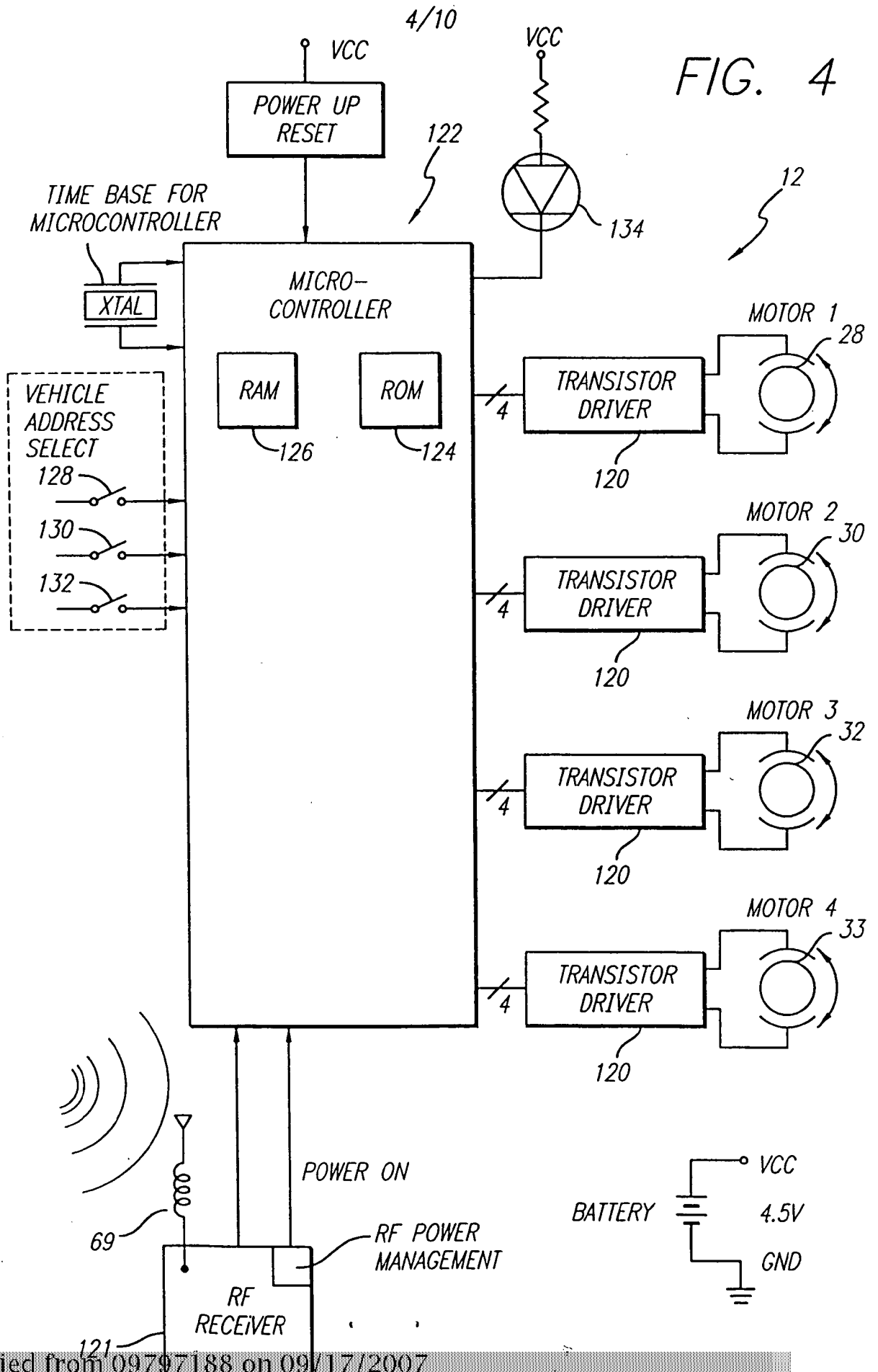


FIG. 5

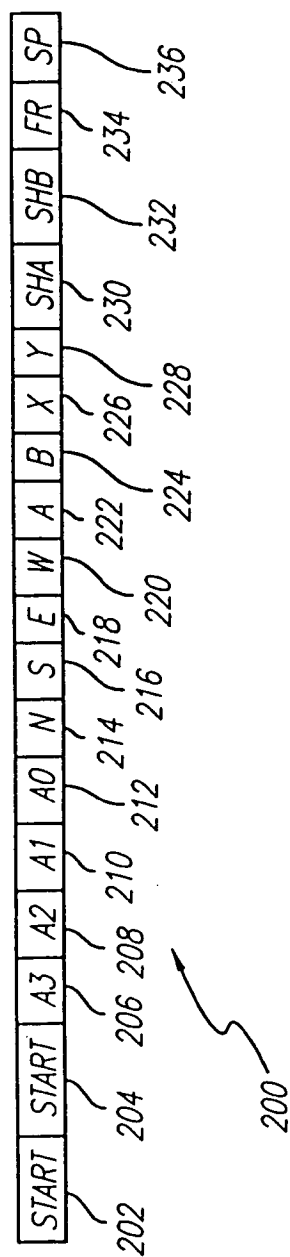


FIG. 6A

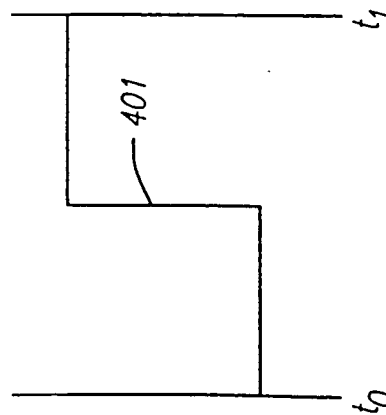


FIG. 6B

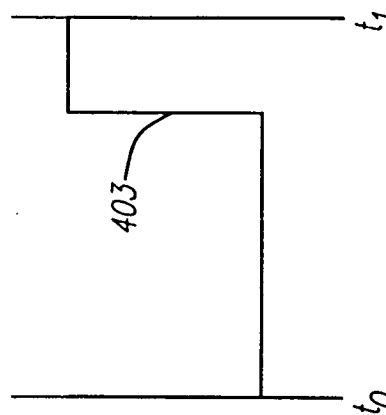
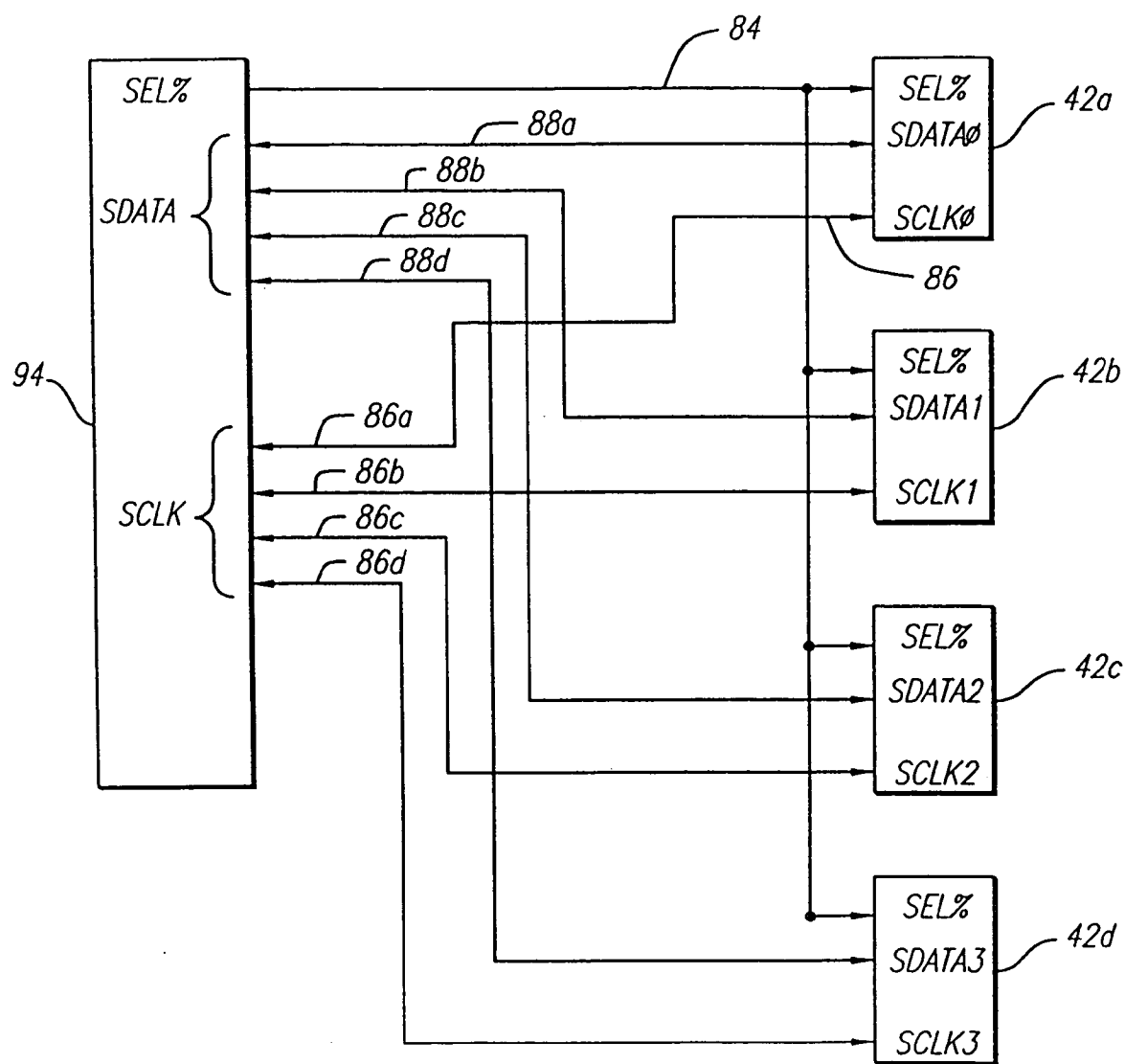


FIG. 7



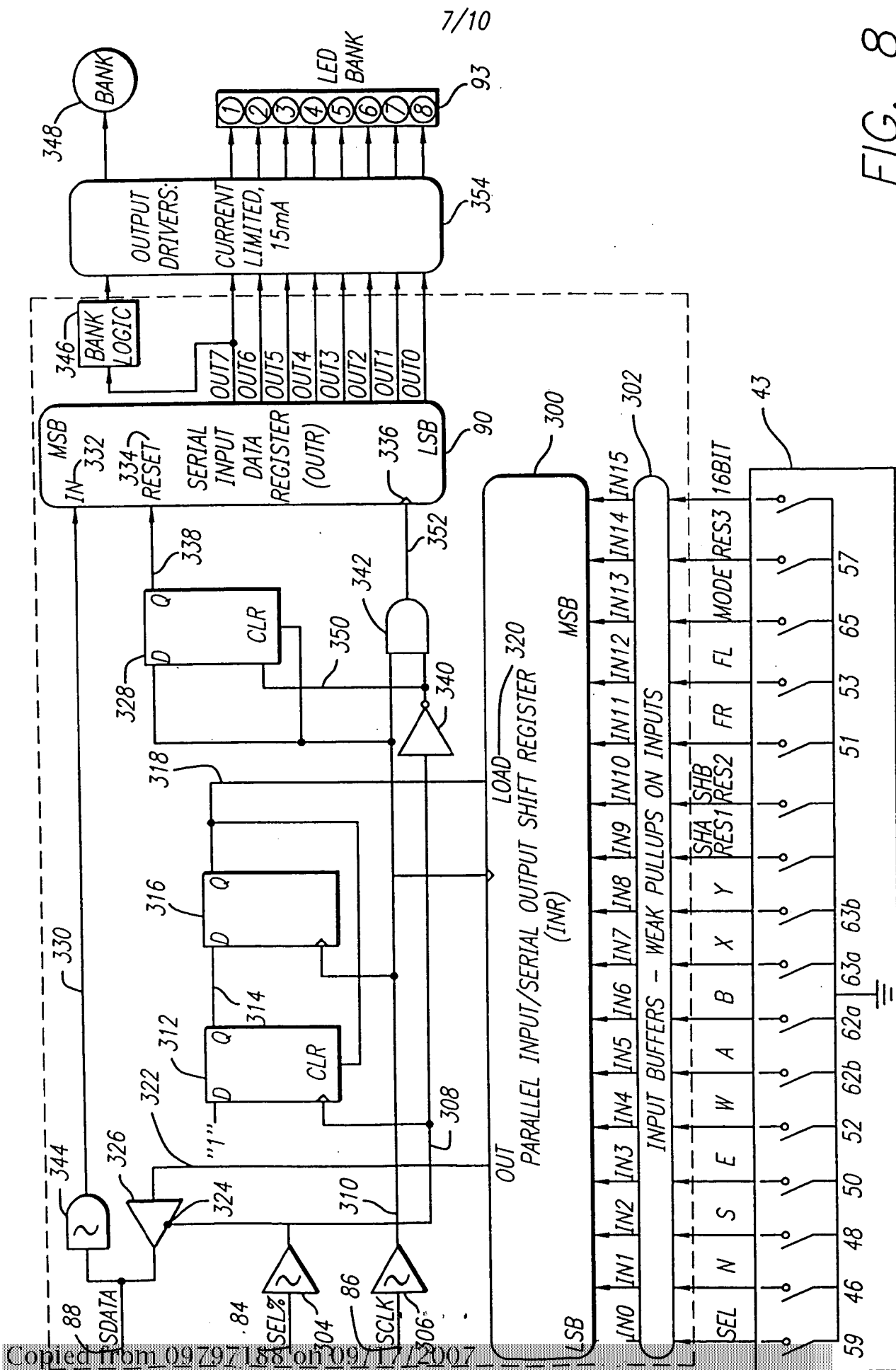


FIG. 8



FIG. 9-1

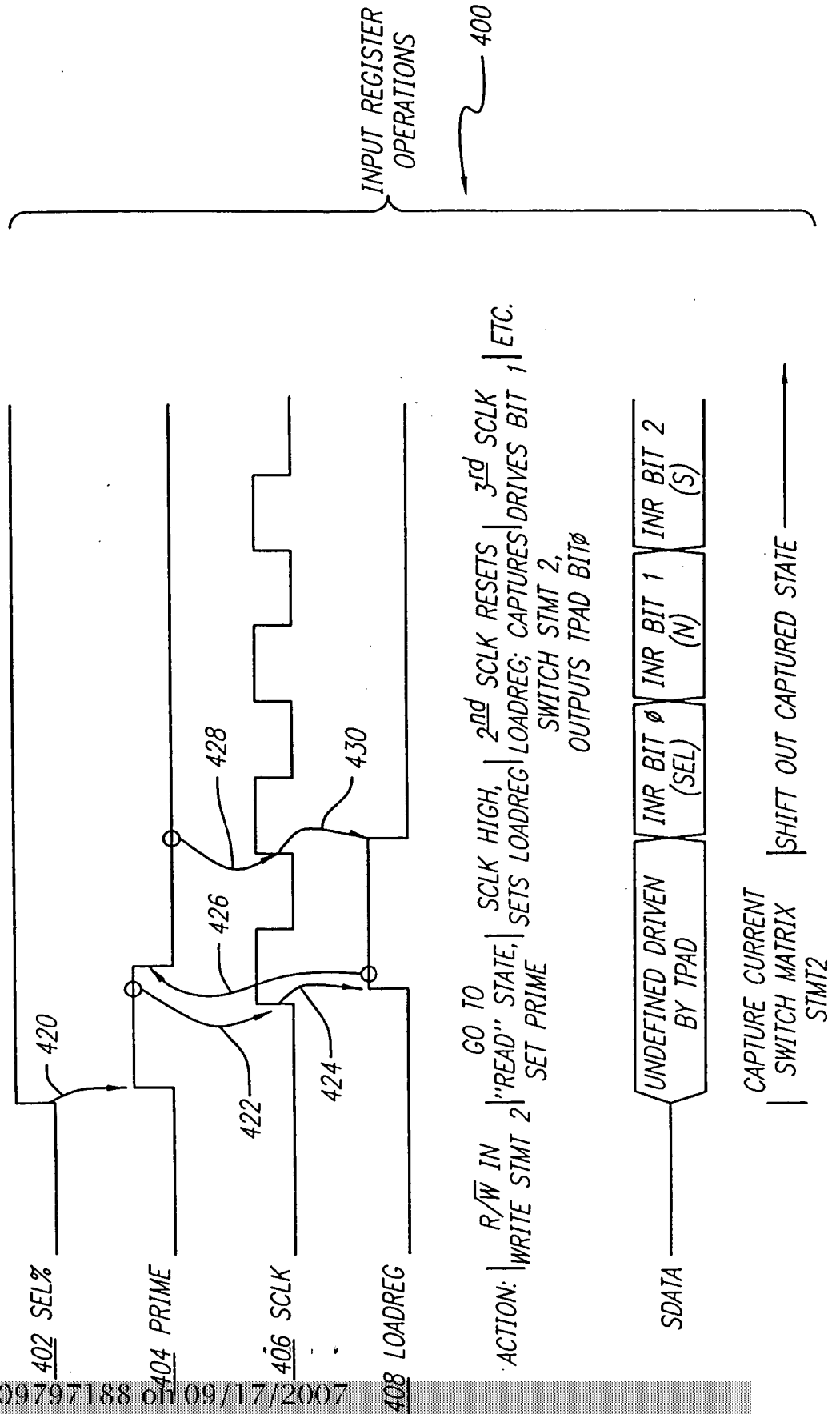
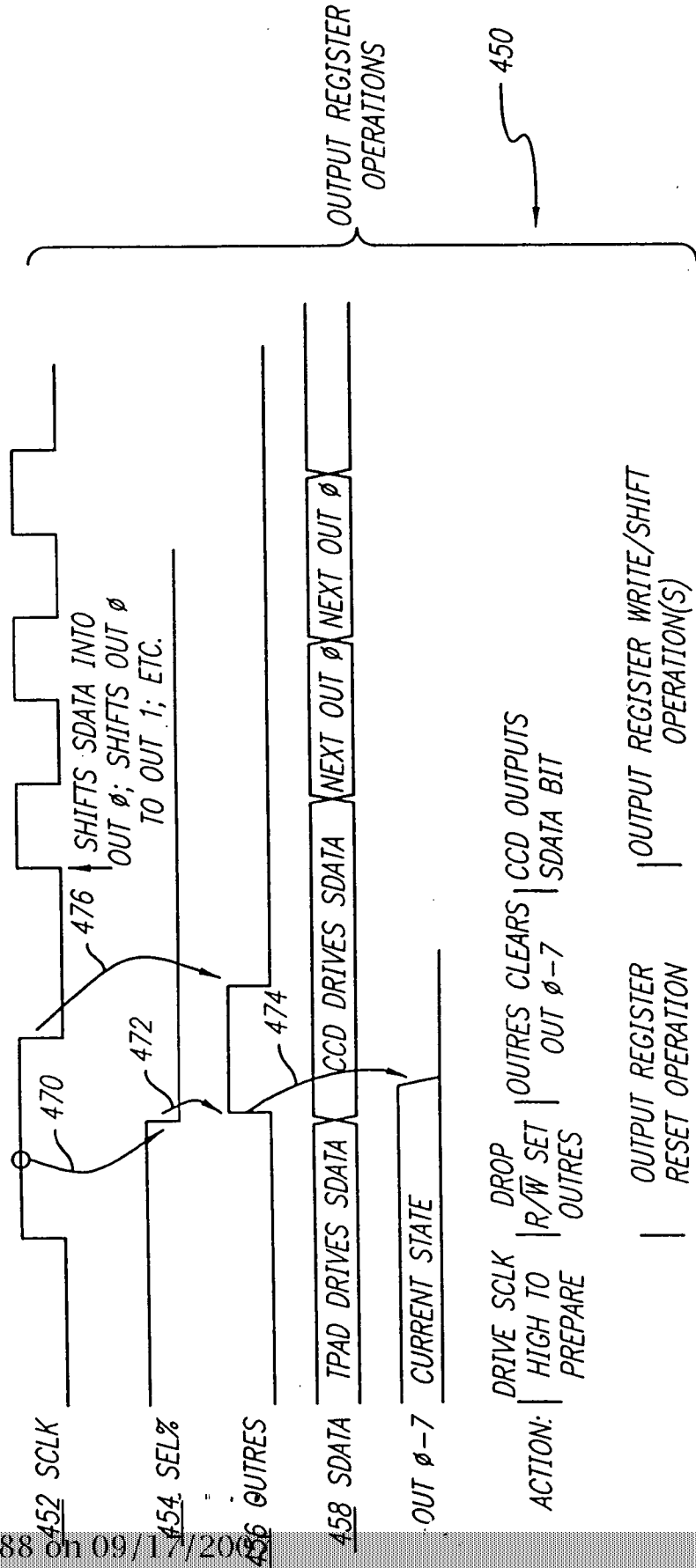
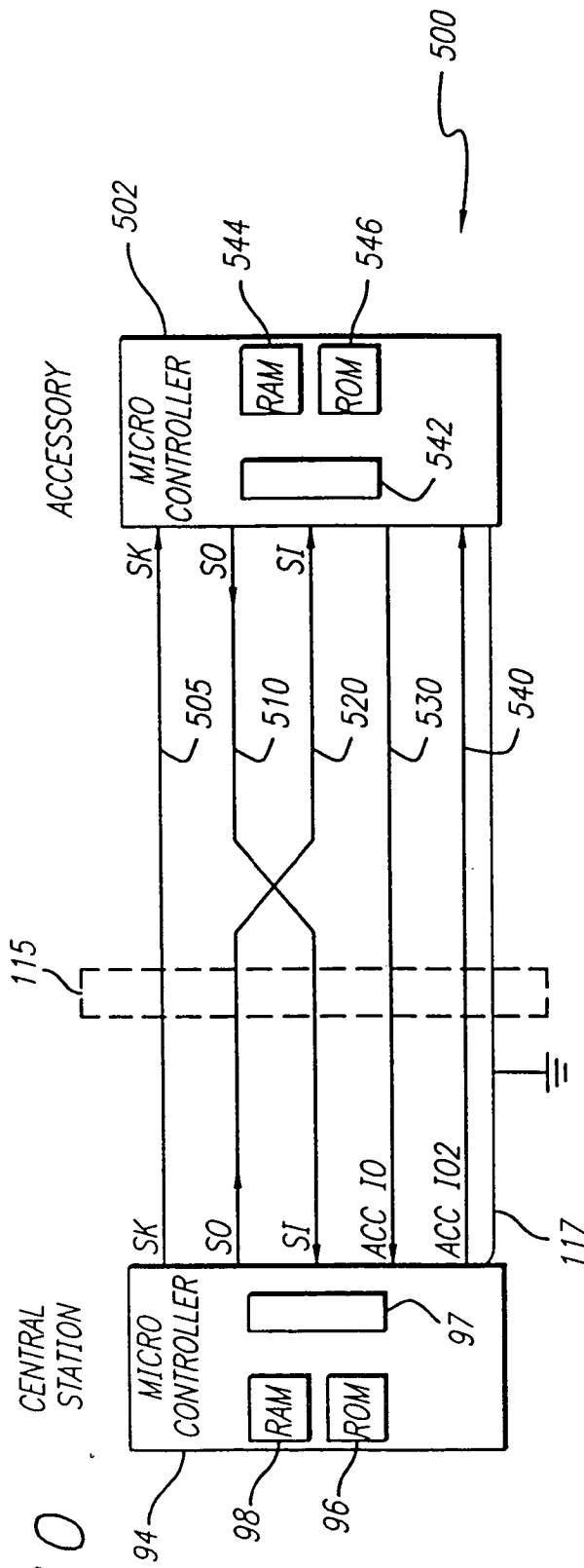
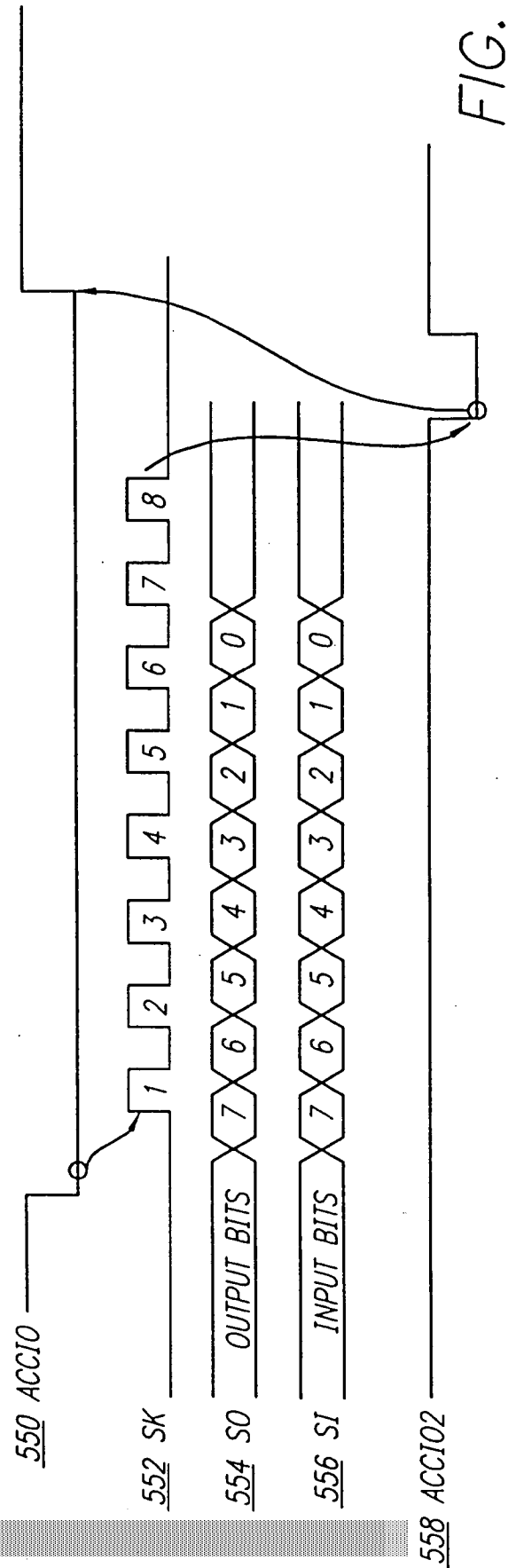


FIG. 9-2



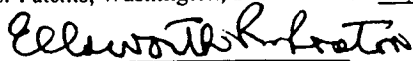


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Ellsworth R. Roston, Reg. No. 16,310

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of	)	Date: August 2, 2000
	)	
PETER C. DeANGELIS	)	Group No.: 3712
	)	
Serial No.: 08/797,188	)	Examiner: D. Muir
	)	
Filed: February 11, 1997	)	Docket No.: ROKEN-40907
	)	
For: SYSTEM AND METHOD FOR	)	Los Angeles, California 90024
CONTROLLING THE	)	
OPERATION OF TOYS	)	[147026.7]

CHANGE OF CORRESPONDENCE ADDRESS

Assistant Commissioner for Patents  
Washington, D.C. 20231

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Ellsworth R. Roston, Esq.  
FULWIDER PATTON LEE & UTECHT, LLP  
HOWARD HUGHES CENTER  
6060 Center Drive, Tenth Floor  
Los Angeles, California 90045  
(310) 824-5555 - Telephone  
(310) 824-9696 - Facsimile

Respectfully submitted,



Ellsworth R. Roston  
Registration No. 16,310  
Attorney for Applicants

Please acknowledge receipt of our Third Supplemental Amendment Under Rule 16; and Transmittal Form (PTO/SB/21) by affixing hereon the Patent and Trademark Office stamp and returning this card to our office.

Inventor(s): PETER C. DeANGELIS  
Serial No. 08/797,188  
Filed: February 11, 1997  
Title: SYSTEM AND METHOD FOR CONTROLLING  
THE OPERATION OF TOYS  
Docket No.: ROKEN-40907

Mailed: August 13, 1999

ERR:dmc



8/26/99 cm

Please type a plus sign (+) inside this box → ☐

PTO/SB/21 (12-97)  
Approved for use through 8/30/00. OMB 0651-0031  
Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

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<h1>TRANSMITTAL FORM</h1> <p>(to be used for all correspondence after initial filing)</p>	Application Number	08/797,188	
	Filing Date	February 11, 1997	
	First Named Inventor	Peter C. DeAngelis	
	Group Art Unit	3712	
	Examiner Name	D. Muir	
Total Number of Pages in This Submission	9	Attorney Docket Number	ROKEN-40907

ENCLOSURES (check all that apply)		
<input type="checkbox"/> Fee Transmittal Form <input type="checkbox"/> Fee Attached <input checked="" type="checkbox"/> Amendment / Response (3rd Supplemental) <input type="checkbox"/> After Final <input type="checkbox"/> Affidavits/declaration(s) <input type="checkbox"/> Extension of Time Request <input type="checkbox"/> Express Abandonment Request <input type="checkbox"/> Information Disclosure Statement <input type="checkbox"/> Certified Copy of Priority Document(s) <input type="checkbox"/> Response to Missing Parts/Incomplete Application <input type="checkbox"/> Response to Missing Parts under 37 CFR 1.52 or 1.53	<input type="checkbox"/> Assignment Papers (for an Application) <input type="checkbox"/> Drawing(s) <input type="checkbox"/> Licensing-related Papers <input type="checkbox"/> Petition Routing Slip (PTO/SB/69) and Accompanying Petition <input type="checkbox"/> To Convert a Provisional Application <input type="checkbox"/> Power of Attorney, Revocation Change of Correspondence Address <input type="checkbox"/> Terminal Disclaimer <input type="checkbox"/> Small Entity Statement <input type="checkbox"/> Request for Refund	<input type="checkbox"/> After Allowance Communication to Group <input type="checkbox"/> Appeal Communication to Board of Appeals and Interferences <input type="checkbox"/> Appeal Communication to Group (Appeal Notice, Brief, Reply Brief) <input type="checkbox"/> Proprietary Information <input type="checkbox"/> Status Letter <input type="checkbox"/> Additional Enclosure(s) (please identify below)
Remarks		

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT	
Firm or Individual name	FULWIDER PATTON LEE & UTECHT, LLP ELLSWORTH R. ROSTON, ESQ., REG. NO. 16,310
Signature	<i>Ellsworth R. Roston</i>
Date	AUGUST 13, 1999

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Signature	<i>Ellsworth R. Roston</i>	Date	8-13-99

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20231 on August 13, 1999.

Ellsworth R. Roston

Ellsworth R. Roston, Reg. No. 16,310

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of	)	Date: August 13, 1999
	)	
PETER C. DeANGELIS	)	Group No.: 3712
	)	
Serial No.: 08/797,188	)	Examiner: D. Muir
	)	
Filed: February 11, 1997	)	Docket No.: ROKEN-40907
	)	
For: SYSTEM AND METHOD FOR	)	Los Angeles, California 90024
CONTROLLING THE	)	
OPERATION OF TOYS	)	[#147026:v2]

**THIRD SUPPLEMENTAL AMENDMENT UNDER RULE 116**

Assistant Commissioner for Patents  
Washington, D.C. 20231

Sir:

In response to the Advisory Action (undated) comprising Paper Number 13, please retain  
only the following claims in the application:

1-13, 18-22, 30, 32-35, 40-42, 57-60, 63-80, 82-91, 96-99, 104-106, 124, 125, 148, 149,  
152, 153 and 162-164.

**IN THE CLAIMS:**

Claim 18, line 14, change "central station" to – individual one of the pads –.

Claim 70, line 7, change "lines" to – line –.

Claim 85 (Amended): In combination as set forth in claim 84,

the pad providing a plurality of lights each indicating, when illuminated, the addressing of an individual one of the [such] vehicles by the pad and wherein

means are provided for illuminating a particular one of the lights in accordance with the signals passing through the third line from the central station to the pad.

**PLEASE REWRITE THE FOLLOWING CLAIMS IN INDEPENDENT FORM AS  
FOLLOWS:**

Claim 101 (Twice Amended): In combination for use with a plurality of vehicles,  
a plurality of pads each operative to provide a first plurality of binary indications  
addressing any individual one of the vehicles and to provide a second plurality of binary  
indications providing commands to such individual one of the vehicles for operating such  
5 vehicle,

a central station,

the pads in the plurality being connected to the central station,



first means in the central station for interrogating the pads to determine the first and second binary indications from such pads,

10      second means in the pads for transmitting the first and second binary indications from the pads to the central station, and

third means responsive in the central station to the identities of the first binary indications in successive transmissions of the first and second binary indications from each individual one of the pads to the central station for transmitting to the vehicles signals representing the first and  
15      second binary indications for such pad,

fourth means in the central station for providing a transmittal by the second means at each instant only of the second binary indications from the pads which are providing changes in address or commands at that instant, [In a combination as set forth in claim 100,]

an additional pad being connected to the central station, and

20      fifth means in the central station for providing for an addressing by the additional pad of any of the vehicles not being addressed by the pads in the plurality and for providing for a transmission by the third means of the signals representing the first and second binary indications for the additional pad to the vehicles in the plurality instantaneously after the additional pad is connected to the central station.

Claim 102 (Twice Amended): In combination for use with a plurality of vehicles,  
a plurality of pads each operative to provide a first plurality of binary indications  
addressing any individual one of the vehicles and to provide a second plurality of binary  
indications providing commands to such individual one of the vehicles for operating such  
5 vehicle,

a central station,

the pads in the plurality being connected to the central station,

first means in the central station for interrogating the pads to determine the first and  
second binary indications from such pads,

10 second means in the pads for transmitting the first and second binary indications from the  
pads to the central station, and

third means responsive in the central station to the identities of the first binary indications  
in successive transmissions of the first and second binary indications from each individual one of  
the pads to the central station for transmitting to the vehicles signals representing the first and  
15 second binary indications for such pad,

fourth means in the central station for providing a transmittal by the second means at each  
instant only of the second binary indications from the pads which are providing changes in  
address or commands at that instant, [In a combination as set forth in claim 100,]

the first means in the central station being operative to interrogate the pads on a cyclic  
20 basis to obtain the binary indications from each of the pads, on the cyclic basis with the other

pads, of the individual one of the vehicles addressed by such pad and the binary indications for providing commands for operating the individual one of the vehicles.

Claim 128 (Twice Amended): In combination,

a plurality of vehicles each having an individual address,

a plurality of pads each operative to provide an address for selecting any individual one of the vehicles and to provide commands to such individual one of the vehicles for operating

5 such individual one of the vehicles in accordance with such commands,

a central station, the pads being connected to the central station,

each of the pads being operative to transmit the address and the commands from such pad to the central station for transmission by the central station to the vehicles,

10 each individual one of the vehicles having a light for illumination when such vehicle is addressed and commanded by the central station as a result of the address and commands from an individual one of the pads,

first means in the central station for storing the addressing by each individual one of the pads of the individual one of the vehicles,

15 second means in the central station for communicating a command to the individual one of the vehicles to extinguish the light in such vehicle instantaneously after the individual one of the pads providing the address and the commands to such individual one of the vehicles becomes disconnected from the central station, and

third means in each individual one of the vehicles for extinguishing the light in such individual one of the vehicles in accordance with the communication from the central station,

20      fourth means in the central station for eliminating the storage of the addressing by each individual one of the pads of the individual one of the vehicles instantaneously after such individual one of the pads becomes disconnected from the central station,

[In a combination as set forth in claim 127,]

25      fifth means in the central station for interrogating the pads connected to the central station to determine the address and the commands from such pad to the vehicles,

sixth means for receiving in the vehicles from the central station the address and the commands provided by each of the pads upon the interrogation of such pad by the central station, and

30      seventh means in the central station for eliminating one of the pads from the interrogation by the central station, instantaneously after such pad becomes disconnected from the central station, without affecting the interrogation of the other pads by the central station and for providing for the addressing by any of the other pads of the vehicle previously addressed by the disconnected pad.

REMARKS

Claims 1-13, 18-22, 30, 32-35, 40-42, 57-60, 63-80, 82-91, 96-99, 104-106, 124, 125, 148, 149, 152, 153 and 162-164 have been allowed by the Examiner. Claims 101, 102 and 128 have been indicated by the Examiner as being allowable if rewritten in independent form. Applicant has accordingly rewritten claims 101, 102 and 128 in independent form.

Applicant submitted a Second Supplemental Amendment Under Rule 116 on or about July 26, 1999. The Examiner has not acted on this proposed amendment. Applicant is accordingly submitting these proposed changes in this Third Supplemental Amendment Under Rule 116. Changes have been proposed in claims 18, 78 and 85 to make obvious changes clarifying the meaning of the claims. These changes do not affect the scope of the claims. Accordingly, applicant respectfully requests the Examiner to enter the changes proposed for claims 18, 70 and 85 in this Third Supplemental Amendment Under Rule 116.

Since these are the only matters now remaining in the application, reconsideration and allowance of the application are respectfully requested.

Respectfully submitted,

Ellsworth R. Roston  
Ellsworth R. Roston  
Registration No. 16,310  
Attorney for Applicants

ERR:dmc

FULWIDER PATTON LEE & UTECHT, LLP  
10877 Wilshire Boulevard, Tenth Floor  
Los Angeles, CA 90024  
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Facsimile: (310) 824-9696

Please acknowledge receipt of our Third Supplemental Amendment Under Rule 116; and Transmittal Form (PTO/SB/21) by affixing hereon the Patent and Trademark Office stamp and returning this card to our office.

Inventor(s): PETER C. DeANGELIS

Serial No.08/797,188

Filed: February 11, 1997

Title: SYSTEM AND METHOD FOR CONTROLLING  
THE OPERATION OF TOYS

Docket No.: ROKEN-40907

Mailed: August 13, 1999

ERR:dmc

Applicant: ROKENBOK TOY COMPANY

Docket No.: ROKEN-40907

Atty/Secy: ERR/cm

Serial No.: 08/797,188

Filed: February 11, 1997

Title: SYSTEM AND METHOD FOR CONTROLLING THE OPERATION OF TOYS

Inventor(s): PETER C. DeANGELIS

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☐ Deposit Account No. \_\_\_\_\_ Order (Dupl./Tripl.)  
☐ Extension of Time  
☒ Amendment (2<sup>nd</sup> Supplemental under Rule 116)  
☐ Amendment After Final  
☐ Affidavit/Declaration  
☐ Issue Fee (PTOL 85b)  
☐ Check No. \_\_\_\_\_ for \$ \_\_\_\_\_ for fees relating to the above-referenced documents.



**received**  
8/5/99 cm



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<h1>TRANSMITTAL FORM</h1> <p><i>(to be used for all correspondence after initial filing)</i></p>	Application Number	08/797,188
	Filing Date	February 11, 1997
	First Named Inventor	PETER C. DeANGELIS
	Group Art Unit	3712
	Examiner Name	D. Muir
Total Number of Pages in This Submission	Attorney Docket Number	ROKEN-40907

ENCLOSURES (check all that apply)		
<input type="checkbox"/> Fee Transmittal Form <input type="checkbox"/> Fee Attached <input checked="" type="checkbox"/> Amendment/Response (and Supplemental) <input type="checkbox"/> After Final <input type="checkbox"/> Affidavits/declaration(s) <input type="checkbox"/> Extension of Time Request <input type="checkbox"/> Express Abandonment Request <input type="checkbox"/> Information Disclosure Statement <input type="checkbox"/> Certified Copy of Priority Document(s) <input type="checkbox"/> Response to Missing Parts/Incomplete Application <input type="checkbox"/> Response to Missing Parts under 37 CFR 1.52 or 1.53	<input type="checkbox"/> Assignment Papers (for an Application) <input type="checkbox"/> Drawing(s) <input type="checkbox"/> Licensing-related Papers <input type="checkbox"/> Petition Routing Slip (PTO/SB/69) and Accompanying Petition <input type="checkbox"/> To Convert a Provisional Application <input type="checkbox"/> Power of Attorney, Revocation Change of Correspondence Address <input type="checkbox"/> Terminal Disclaimer <input type="checkbox"/> Small Entity Statement <input type="checkbox"/> Request for Refund	<input type="checkbox"/> After Allowance Communication to Group <input type="checkbox"/> Appeal Communication to Board of Appeals and Interferences <input type="checkbox"/> Appeal Communication to Group (Appeal Notice, Brief, Reply Brief) <input type="checkbox"/> Proprietary Information <input type="checkbox"/> Status Letter <input checked="" type="checkbox"/> Additional Enclosure(s) (please identify below): <div style="border: 1px solid black; padding: 5px; margin-top: 5px;">Postcard</div>
<div style="border: 1px solid black; padding: 5px;">Remarks</div>		

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT	
Firm or individual name	FULWIDER PATTON LEE & UTECHT, LLP ELLSWORTH R. ROSTON, ESQ., REG. NO. 16,310
Signature	<i>Ellsworth R. Roston</i>
Date	July 26, 1999

CERTIFICATE OF MAILING			
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Typed or printed name	ELLSWORTH R. ROSTON, ESQ., REG. NO. 16,310		
Signature	<i>Ellsworth R. Roston</i>	Date	July 26, 1999

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<b>PATENT APPLICATION FEE DETERMINATION RECORD</b>	Application or Docket Number <div style="border: 1px solid black; padding: 2px; text-align: center;">08/797,188 (ROKEN-40907)</div>
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CLAIMS AS FILED - PART I					SMALL ENTITY		OR		OTHER THAN SMALL ENTITY	
(Column 1)		(Column 2)			RATE	FEE			RATE	FEE
FOR	NUMBER FILED	NUMBER EXTRA								
BASIC FEE (37 CFR 1.16(a))										
TOTAL CLAIMS (37 CFR 1.16(c))	minus 20 =			*	x \$	=			x \$	=
INDEPENDENT CLAIMS (37 CFR 1.16(b))	minus 3 =			*	x	=			x	=
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(d))					+	=			+	=
					TOTAL				TOTAL	

\* If the difference in column 1 is less than zero, enter "0" in column 2

CLAIMS AS AMENDED - PART II					SMALL ENTITY		OR		OTHER THAN SMALL ENTITY	
(Column 1)		(Column 2)		(Column 3)	RATE	ADDI- TIONAL FEE			RATE	ADDI- TIONAL FEE
AMENDMENT A		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA					
	Total (37 CFR 1.16(c))	* 129	Minus	** 131	= 0	x \$	= 0			x \$
	Independent (37 CFR 1.16(b))	* 45	Minus	*** 44	= 1	x 39	= 39			x
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(d))					+	=			+
					TOTAL	39			TOTAL	

(Column 1) (Column 2) (Column 3)					SMALL ENTITY		OR		OTHER THAN SMALL ENTITY	
AMENDMENT B		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA					
	Total (37 CFR 1.16(c))	* 126	Minus	** 129	= 0	x \$	=			x \$
	Independent (37 CFR 1.16(b))	* 43	Minus	*** 45	= 0	x	=			x
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(d))					+	=			+
					TOTAL				TOTAL	

(Column 1) (Column 2) (Column 3)					SMALL ENTITY		OR		OTHER THAN SMALL ENTITY	
AMENDMENT C		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA					
	Total (37 CFR 1.16(c))	* 126	Minus	** 126	= 0	x \$	=			x \$
	Independent (37 CFR 1.16(b))	* 43	Minus	*** 43	= 0	x	=			x
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(d))					+	=			+
					TOTAL				TOTAL	

- \* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
  - \*\* If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
  - \*\*\* If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
- The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

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# PATENT APPLICATION FEE DETERMINATION RECORD

Application or Docket Number

ROKEN-40907

## CLAIMS AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA
BASIC FEE (37 CFR 1.16(a))		
TOTAL CLAIMS (37 CFR 1.16(c))	151 minus 20 =	* 131
INDEPENDENT CLAIMS (37 CFR 1.16(b))	51 minus 3 =	* 48
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(d))		

\* If the difference in column 1 is less than zero, enter "0" in column 2

SMALL ENTITY

OR  
OTHER THAN  
SMALL ENTITY

RATE	FEE
	\$
x \$	=
x	=
+	=
TOTAL	

RATE	FEE
	\$
x \$	=
x	=
+	=
TOTAL	

## CLAIMS AS AMENDED - PART II

AMENDMENT A	(Column 1) CLAIMS REMAINING AFTER AMENDMENT	(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA
Total (37 CFR 1.16(c))	* 151	Minus ** 151	= 0
Independent (37 CFR 1.16(b))	* 51	Minus *** 51	= 0
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(d))			

SMALL ENTITY

OR  
OTHER THAN  
SMALL ENTITY

RATE	ADDI- TIONAL FEE
x \$	=
x	=
+	=
TOTAL ADDIT. FEE	

RATE	ADDI- TIONAL FEE
x \$	=
x	=
+	=
TOTAL ADDIT. FEE	

AMENDMENT B	(Column 1) CLAIMS REMAINING AFTER AMENDMENT	(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA
Total (37 CFR 1.16(c))	* 133	Minus ** 151	= 0
Independent (37 CFR 1.16(b))	* 45	Minus *** 51	= 0
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(d))			

TOTAL  
ADDIT. FEE

RATE	ADDI- TIONAL FEE
x \$	=
x	=
+	=
TOTAL ADDIT. FEE	

TOTAL  
ADDIT. FEE

RATE	ADDI- TIONAL FEE
x \$	=
x	=
+	=
TOTAL ADDIT. FEE	

AMENDMENT C	(Column 1) CLAIMS REMAINING AFTER AMENDMENT	(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA
Total (37 CFR 1.16(c))	* 131	Minus ** 133	= 0
Independent (37 CFR 1.16(b))	* 44	Minus *** 45	= 0
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(d))			

TOTAL  
ADDIT. FEE

RATE	ADDI- TIONAL FEE
x \$	=
x	=
+	=
TOTAL ADDIT. FEE	

TOTAL  
ADDIT. FEE

RATE	ADDI- TIONAL FEE
x \$	=
x	=
+	=
TOTAL ADDIT. FEE	

\* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

\*\* If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

\*\*\* If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".


The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

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20231 on July 26, 1999.

  
Ellsworth R. Roston, Reg. No. 16,310

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re application of	)	Examiner: D. Muir
	)	
PETER C. DeANGELIS	)	Group Art Unit: 3712
	)	
Serial No: 08/797,188	)	Docket No. ROKEN-40907
	)	[#121297/v.6]
	)	
Filed: February 11, 1997	)	Date: July 26, 1999
	)	
For: SYSTEM AND METHOD FOR	)	Los Angeles, California 90024
CONTROLLING THE	)	
OPERATION OF TOYS	)	

**SECOND SUPPLEMENTAL AMENDMENT**  
**UNDER RULE 116**

ASSISTANT COMMISSIONER FOR PATENTS  
Washington, D.C. 20231

Sir:

Supplemental to the amendment filed in the USPTO on or about July 7, 1999,  
please amend the above-identified application as follows:

**IN THE CLAIMS:**

Claim 18, line 14, change “central station” to –individual one of the pads–.

Claim 70, line 7, change “lines” to –line–.

Claim 85 (Amended): In combination as set forth in claim 84,

the pad providing a plurality of lights each indicating, when illuminated, the  
addressing of an individual one of the [such] vehicles by the pad and wherein

means are provided for illuminating a particular one of the lights in accordance  
with the signals passing through the third line from the central station to the pad.

5

REMARKS

This second supplemental amendment is being submitted under Rule 116 to place the application in condition for allowance or at least in improved condition for appeal.

Accordingly, applicant respectfully requests the Examiner to enter the proposed amendment.

Changes are being made in claims 18, 70 and 85 to make obvious corrections clarifying the meaning of the claims.

Reconsideration and allowance of the application are respectfully requested.

Respectfully submitted,

Ellsworth R. Roston  
Ellsworth R. Roston  
Registration No. 16,310  
Attorney for Applicant

ERR:cm

FULWIDER PATTON LEE & UTECHT, LLP  
10877 Wilshire Boulevard, Tenth Floor  
Los Angeles, CA 90024  
TEL: (310) 824-5555  
FAX: (310) 824-9696

Applicant: ROKENBOK TOY COMPANY

Docket No.: ROKEN-40907

Serial No.: 08/797,188

Atty/Secy: ERR/cm

Filing Date: February 11, 1997

Title: SYSTEM AND METHOD FOR CONTROLLING THE OPERATION OF  
TOYS

Inventor(s): PETER C. DeANGELIS

Please acknowledge receipt of the following documents due on July 29, 1999  
sent by First Class Mail on July 7, 1999 by stamping w/PTO stamp and  
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- ☐ Extension of Time
- ☒ Amendment
- ☐ Amendment After Final
- ☐ Affidavit/Declaration
- ☐ Issue Fee (PTOL 85b)
- ☒ Check No. 062233 for \$39.00 for fees relating to the above-referenced documents.

Applicant: ROKENBOK TOY COMPANY

Docket No.: ROKEN-40907 Atty/Secy: ERR/cm

Serial No.: 08/797,188 Filed: February 11, 1997

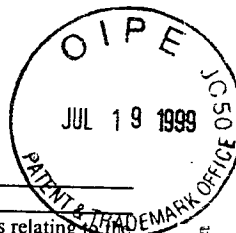
Title: SYSTEM AND METHOD FOR CONTROLLING THE OPERATION OF TOYS

Inventor(s): PETER C. DeANGELIS

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- ☐ Extension of Time
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- ☐ Amendment After Final
- ☐ Affidavit/Declaration
- ☐ Issue Fee (PTOL 85b)

Check No. \_\_\_\_\_ for \$ \_\_\_\_\_ for fees relating  
above-referenced documents.



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PTO/SB/21 (12-97)  
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Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

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<b>TRANSMITTAL FORM</b>  <i>(to be used for all correspondence after initial filing)</i>	Application Number	08/797,188
	Filing Date	February 11, 1997
	First Named Inventor	PETER C. DeANGELIS
	Group Art Unit	3712
	Examiner Name	D. Muir
Total Number of Pages in This Submission		Attorney Docket Number ROKEN-40907

ENCLOSURES (check all that apply)		
<input type="checkbox"/> Fee Transmittal Form <input type="checkbox"/> Fee Attached <input checked="" type="checkbox"/> Amendment/Response (Supplemental) <input type="checkbox"/> After Final <input type="checkbox"/> Affidavits/declaration(s) <input type="checkbox"/> Extension of Time Request <input type="checkbox"/> Express Abandonment Request <input type="checkbox"/> Information Disclosure Statement <input type="checkbox"/> Certified Copy of Priority Document(s) <input type="checkbox"/> Response to Missing Parts/Incomplete Application <input type="checkbox"/> Response to Missing Parts under 37 CFR 1.52 or 1.53	<input type="checkbox"/> Assignment Papers (for an Application) <input type="checkbox"/> Drawing(s) <input type="checkbox"/> Licensing-related Papers <input type="checkbox"/> Petition Routing Slip (PTO/SB/69) and Accompanying Petition <input type="checkbox"/> To Convert a Provisional Application <input type="checkbox"/> Power of Attorney, Revocation Change of Correspondence Address <input type="checkbox"/> Terminal Disclaimer <input type="checkbox"/> Small Entity Statement <input type="checkbox"/> Request for Refund	<input type="checkbox"/> After Allowance Communication to Group <input type="checkbox"/> Appeal Communication to Board of Appeals and Interferences <input type="checkbox"/> Appeal Communication to Group (Appeal Notice, Brief, Reply Brief) <input type="checkbox"/> Proprietary Information <input type="checkbox"/> Status Letter <input type="checkbox"/> Additional Enclosure(s) (please identify below): <div style="border: 1px solid black; height: 40px; width: 100%;"></div>
Remarks <div style="border: 1px solid black; height: 40px; width: 100%;"></div>		

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT	
Firm or Individual name	FULWIDER PATTON LEE & UTECHT, LLP ELLSWORTH R. ROSTON, ESQ., REG. NO. 16,310
Signature	<i>Ellsworth R. Roston</i>
Date	July 14, 1999

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Typed or printed name	ELLSWORTH R. ROSTON, ESQ., REG. NO. 16,310		
Signature	<i>Ellsworth R. Roston</i>	Date	July 14, 1999

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## PATENT APPLICATION FEE DETERMINATION RECORD

Application or Docket Number

08/797,188 (ROKEN-40907)

## CLAIMS AS FILED - PART I

(Column 1)

(Column 2)

SMALL ENTITY

OR

OTHER THAN  
SMALL ENTITY

FOR	NUMBER FILED (Column 1)	NUMBER EXTRA (Column 2)
BASIC FEE (37 CFR 1.16(a))		
TOTAL CLAIMS (37 CFR 1.16(c))	minus 20 =	*
INDEPENDENT CLAIMS (37 CFR 1.16(b))	minus 3 =	*
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(d))		

RATE	FEE
	\$ _____
x \$ _____ =	
x _____ =	
+ _____ =	
TOTAL	

RATE	FEE
	\$ _____
x \$ _____ =	
x _____ =	
+ _____ =	
TOTAL	

\* If the difference in column 1 is less than zero, enter "0" in column 2

## CLAIMS AS AMENDED - PART II

(Column 1)

(Column 2)

(Column 3)

SMALL ENTITY

OR

OTHER THAN  
SMALL ENTITY

AMENDMENT A		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
	Total (37 CFR 1.16(c))	*	129	Minus	** 131
Independent (37 CFR 1.16(b))	*	45	Minus	*** 44	= 1
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(d))					

RATE	ADDI- TIONAL FEE
	0
x \$ _____ =	
x 39 =	39
+ _____ =	
TOTAL	39

RATE	ADDI- TIONAL FEE
x \$ _____ =	
x _____ =	
+ _____ =	
TOTAL	

(Column 1)

(Column 2)

(Column 3)

TOTAL  
ADDIT. FEETOTAL  
ADDIT. FEE

AMENDMENT B		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
	Total (37 CFR 1.16(c))	*	126	Minus	** 129
Independent (37 CFR 1.16(b))	*	43	Minus	*** 45	= 0
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(d))					

RATE	ADDI- TIONAL FEE
x \$ _____ =	
x _____ =	
+ _____ =	
TOTAL	

RATE	ADDI- TIONAL FEE
x \$ _____ =	
x _____ =	
+ _____ =	
TOTAL	

(Column 1)

(Column 2)

(Column 3)

TOTAL  
ADDIT. FEETOTAL  
ADDIT. FEE

AMENDMENT C		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
	Total (37 CFR 1.16(c))	*		Minus	**
Independent (37 CFR 1.16(b))	*		Minus	***	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(d))					

RATE	ADDI- TIONAL FEE
x \$ _____ =	
x _____ =	
+ _____ =	
TOTAL	

RATE	ADDI- TIONAL FEE
x \$ _____ =	
x _____ =	
+ _____ =	
TOTAL	

\* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

\*\* If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

\*\*\* If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

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PATENT APPLICATION FEE DETERMINATION RECORD					Application or Docket Number <b>ROKEN-40907</b>	
<b>CLAIMS AS FILED - PART I</b>						
(Column 1)		(Column 2)			(Column 3)	
FOR	NUMBER FILED	NUMBER EXTRA				
BASIC FEE (37 CFR 1.16(a))	[REDACTED]					
TOTAL CLAIMS (37 CFR 1.16(c))	151	minus 20 =	*	131		
INDEPENDENT CLAIMS (37 CFR 1.16(b))	51	minus 3 =	*	48		
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(d))						
* If the difference in column 1 is less than zero, enter "0" in column 2						
<b>CLAIMS AS AMENDED - PART II</b>						
(Column 1)		(Column 2)			(Column 3)	
AMENDMENT A	[REDACTED]	CLAIMS REMAINING AFTER AMENDMENT	[REDACTED]	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	
	Total (37 CFR 1.16(c))	* 151	Minus	** 151	= 0	
	Independent (37 CFR 1.16(b))	* 51	Minus	*** 51	= 0	
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(d))					
	TOTAL ADDIT. FEE					
AMENDMENT B	[REDACTED]	CLAIMS REMAINING AFTER AMENDMENT	[REDACTED]	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	
	Total (37 CFR 1.16(c))	* 133	Minus	** 151	= 0	
	Independent (37 CFR 1.16(b))	* 45	Minus	*** 51	= 0	
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(d))					
	TOTAL ADDIT. FEE					
AMENDMENT C	[REDACTED]	CLAIMS REMAINING AFTER AMENDMENT	[REDACTED]	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	
	Total (37 CFR 1.16(c))	* 131	Minus	** 133	= 0	
	Independent (37 CFR 1.16(b))	* 44	Minus	*** 45	= 0	
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(d))					
	TOTAL ADDIT. FEE					

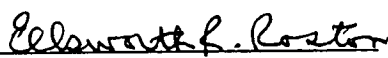
• If the entry in column 1 is less than the entry in column 2, write "0" in column 3.  
 • If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".  
 • If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".  
 The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

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PATENT

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Ellsworth R. Roston, Reg. No. 16,310

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of	)	Examiner: D. Muir
	)	
PETER C. DeANGELIS	)	Group Art Unit: 3712
	)	
Serial No: 08/797,188	)	Docket No. ROKEN-40907
	)	[#121297/v.5]
Filed: February 11, 1997	)	
	)	Date: July 14, 1999
	)	
For: SYSTEM AND METHOD FOR	)	Los Angeles, California 90024
CONTROLLING THE	)	
OPERATION OF TOYS	)	

SUPPLEMENTAL AMENDMENT UNDER RULE 116

ASSISTANT COMMISSIONER FOR PATENTS  
Washington, D.C. 20231

Sir:

Supplemental to the amendment filed in the USPTO on or about July 7, 1999,  
please amend the above-identified application as follows:

**IN THE CLAIMS:**

Please cancel claims 43, 44 and 158.

**REMARKS**

Applicant is canceling claims 43, 44 and 158, without prejudice, to avoid possible problems relating to double patenting with respect to prior applications of the common assignee.

Reconsideration and allowance of the application are respectfully requested.

Respectfully submitted,



Ellsworth R. Roston

Registration No. 16,310

Attorney for Applicant

ERR:cm

FULWIDER PATTON LEE & UTECHT, LLP

10877 Wilshire Boulevard, Tenth Floor

Los Angeles, CA 90024

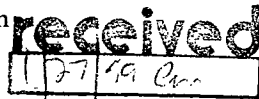
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FAX: (310) 824-9696

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(w/Certificate of Mailing thereon); Transmittal Letter (in  
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stamp and returning this card to our office in re application of:

Applicant: PETER C. DeANGELIS  
Client: ROKENBOK TOY COMPANY  
Title: SYSTEM AND METHOD FOR CONTROLLING THE  
OPERATION OF TOYS  
Serial No.: 08/797,188  
Filing Date: February 11, 1997  
Client/Matter No.: ROKEN-40907  
Date Mailed: January 12, 1999

ERR:cm



Please type a plus sign (+) inside this box → ☐

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<h1>TRANSMITTAL FORM</h1> <p>(to be used for all correspondence after initial filing)</p>	Application Number	08/797,188
	Filing Date	February 11, 1997
	First Named Inventor	PETER C. DeANGELIS
	Group Art Unit	3301
	Examiner Name	J. Moore
Total Number of Pages in This Submission	Attorney Docket Number	ROKEN-40907

ENCLOSURES (check all that apply)		
<input type="checkbox"/> Fee Transmittal Form <input type="checkbox"/> Fee Attached <input checked="" type="checkbox"/> Amendment / Response (Supplemental) <input type="checkbox"/> After Final <input type="checkbox"/> Affidavits/declaration(s) <input type="checkbox"/> Extension of Time Request <input type="checkbox"/> Express Abandonment Request <input type="checkbox"/> Information Disclosure Statement <input type="checkbox"/> Certified Copy of Priority Document(s) <input type="checkbox"/> Response to Missing Parts/Incomplete Application <input type="checkbox"/> Response to Missing Parts under 37 CFR 1.52 or 1.53	<input type="checkbox"/> Assignment Papers (for an Application) <input type="checkbox"/> Drawing(s) <input type="checkbox"/> Licensing-related Papers <input type="checkbox"/> Petition Routing Slip (PTO/SB/69) and Accompanying Petition <input type="checkbox"/> To Convert a Provisional Application <input type="checkbox"/> Power of Attorney, Revocation Change of Correspondence Address <input type="checkbox"/> Terminal Disclaimer <input type="checkbox"/> Small Entity Statement <input type="checkbox"/> Request for Refund	<input type="checkbox"/> After Allowance Communication to Group <input type="checkbox"/> Appeal Communication to Board of Appeals and Interferences <input type="checkbox"/> Appeal Communication to Group (Appeal Notice, Brief, Reply Brief) <input type="checkbox"/> Proprietary Information <input type="checkbox"/> Status Letter <input checked="" type="checkbox"/> Additional Enclosure(s) (please identify below): <div style="border: 1px solid black; padding: 5px; margin-top: 5px;">Postcard</div>
Remarks		

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT	
Firm or Individual name	FULWIDER PATTON LEE & UTECHT, LLP ELLSWORTH R. ROSTON, ESQ., REG. NO. 16,310
Signature	<i>Ellsworth R. Roston</i>
Date	January 12, 1999

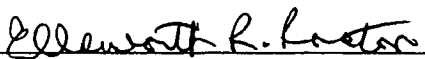
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Signature	<i>Ellsworth R. Roston</i>	Date	January 12, 1999

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20231 on January 12, 1999.

  
Ellsworth R. Roston, Reg. No. 16,310

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of	)	Examiner: J. Moore
	)	
PETER C. DEANGELIS	)	Group Art Unit: 3301
	)	
Serial No: 08/797,188	)	Docket No. ROKEN-40907
	)	[#121297/v.2]
Filed: February 11, 1997	)	
	)	Date: January 12, 1999
	)	
For: SYSTEM AND METHOD FOR	)	Los Angeles, California
CONTROLLING THE	)	
OPERATION OF TOYS	)	

SUPPLEMENTAL AMENDMENT

ASSISTANT COMMISSIONER FOR PATENTS  
Washington, D.C. 20231

Sir:

Supplemental to the amendment filed in the USPTO on or about December 7,  
1998, please amend the above-captioned application as follows:



IN THE CLAIMS:

Claim 20 (twice amended): In combination for use with a central station and a plurality of vehicles for selecting and operating individual ones of the vehicles in accordance with addresses and commands provided by the central station,

a pad in a plurality of pads,

5 a first switch in the pad, the first switch having first and second states and operable on a repetitive basis to the second state for a particular number of times to select an individual one of the vehicles to be addressed by the central station,

a plurality of additional switches in the pad, the additional switches having first and second states and operable to the second state in a particular pattern to obtain the  
10 operation of the individual one of the vehicles in accordance with the pattern of operation of the additional switches in the second state,

a plurality of light indications in the pad, each of the light indications being associated with a different one of the vehicles in the plurality,

means for energizing the light indications in sequence [on a cyclic basis] before  
15 any operations of the first switch in the pad to the second state to select the individual one of the vehicles in the plurality,

means for continuously energizing the individual one of the light indications associated with the individual one of the vehicles when the first switch in the pad has been operated to the second state on the repetitive basis for the particular number of times to  
20 select the individual one of the vehicles to be addressed by the central station, and

means for skipping the energizing of the light indications associated with the vehicles addressed by the pads in the plurality other than the pad when the first switch in the pad is operated on the repetitive basis to address the individual one of the vehicles.

Cancel claims 155 and 157.

Claim 156 (amended): In combination for use with a plurality of vehicles each having an individual address and having members for moving the vehicles,

a central station,

a plurality of pads each operatively connected to the central station and each

5 operative to provide addresses individual to any one of such vehicles and to provide commands for operating such vehicle,

the central station being operative to receive the addresses and commands from the pads and to transmit to the vehicles addresses and commands in packets each composed of a plurality of binary indications representing the address and the commands for an individual one of the vehicles,

10 means in the central station for transmitting the packets of the binary indications to the vehicles, <sup>from each of the pad</sup>  
<sup>in the plurality</sup>

each of the pads including a switch actuatable a number of times to select any one of the vehicles, the particular number of times being dependent upon the particular one of the vehicles to be addressed by the pad,

memory means in the central station for remembering each of the vehicles  
addressed at any instant and the pad addressing the vehicle, and  
means in the central station for preventing each of the pads from addressing one  
of the vehicles already being addressed by another one of the pads,

20

[In a combination as set forth in claim 155,]

there being a plurality of light illuminable members in each pad, each of the light  
illuminable members being operable, when illuminated, to indicate an individual one of the  
vehicles,

25

the preventing means in the central station being operable to prevent each pad  
from illuminating light illuminable members individual to vehicles being addressed by the  
other pads.

Claim 158 (amended): In combination for use with a plurality of vehicles each  
having an individual address and having members for moving the vehicles,

a central station,

5

a plurality of pads coupled to the central station, each of the pads having a first  
member actuatable a sequential number of times to address any one of the vehicles  
dependent upon the number of actuations and having second members actuatable to provide  
for a movement of the addressed vehicle,

35       means in the central station for interrogating the pads to determine the number of  
actuations of the first member in each of the pads and to determine the actuations of the  
second members in each of the pads,

means in the central station for providing for each of the pads first binary  
indications addressing the vehicle being selected by the pad and second binary indications  
relating to the movements to be provided in the vehicle,

40       means in the central station for remembering each pad and the vehicle selected by  
the pad and for providing for the transmittal of such information to the pads, and

means responsive in the pads to the remembered information transmitted to the  
pads from the central station for skipping in each pad the binary indications of vehicles  
already being addressed by others of the pads when the first member in the pad is actuated  
45       the sequential number of times,

      [In a combination as set forth in claim 157,]

      there being in each pad a plurality of light illuminating members each one for a  
different one of the vehicles and each being illuminable to identify the vehicle selected by  
the pad, and

50       means responsive in each pad to the remembered information transmitted to the  
pad from the central station for skipping the light illuminating members indicating the  
vehicles already being addressed by others of the pads when the first member in the pad is  
actuated the sequential number of times to address one of the vehicles.

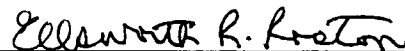
REMARKS

Claims 155 and 157 have been canceled from this application and have been added to application 08/580,753 respectively as claims 142 and 143. Claims 156 and 158 have been amended in this application to incorporate respectively the recitations of claims 155 and 157 and are now independent.

Claim 20 has been amended in this application to provide a cosmetic change which does not affect the allowability of the claim. Claim 20 is allowable over the prior art for the reasons of record in the amendment filed in the USPTO on December 9, 1998.

Reconsideration and allowance of the application are respectfully requested.

Respectfully submitted,



Ellsworth R. Roston  
Registration No. 16,310  
Attorney for Applicant

ERR:cm

FULWIDER PATTON LEE & UTECHT, LLP  
10877 Wilshire Boulevard, Tenth Floor  
Los Angeles, CA 90024  
TEL: (310) 824-5555  
FAX: (310) 824-9696

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Applicant: PETER C. DeANGELIS

Client: ROKENBOK TOY COMPANY

Title: SYSTEM AND METHOD FOR CONTROLLING THE  
OPERATION OF TOYS

Serial No.: 08/797,188

Filing Date: February 11, 1997

Client/Matter No.: ROKEN-40907

Date Mailed: January 12, 1999

ERR:cm

Applicant: ROKENBOK TOY COMPANY

Docket No.: ROKEN-40907

Atty/Secy: ERR/cm

Serial No.: 08/797;188

Filed: February 11, 1998

Title: SYSTEM AND METHOD FOR CONTROLLING THE OPERATION OF TOYS

Inventor(s): PETER C. DeANGELIS

Please acknowledge receipt of the following documents due on December 8, 1998 sent by First Class Mail on December 7, 1998 by stamping w/PTO stamp and returning postcard to addressee.

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☐ Deposit Account No. \_\_\_\_\_ Order (Dupl./Tripl.)

☐ Extension of Time

☐ Amendment

☐ Amendment After Final

☐ Affidavit/Declaration

☐ Issue Fee (PTOL 85b)

☒ X Terminal Disclaimer

☒ X Check No. 059156 for \$ 55.00 for fees relating to the above-referenced documents.

Received  
12/14/98 QAS

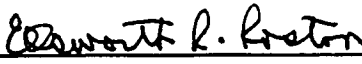


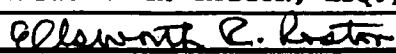
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	Filing Date	February 11, 1998	
	First Named Inventor	PETER C. DeANGELIS	
	Group Art Unit	3301	
	Examiner Name	J. Moore	
Total Number of Pages In This Submission		Attorney Docket Number	ROKEN-40907

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Signature		
Date	December 7, 1998	

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Typed or printed name	ELLSWORTH R. ROSTON, ESQ., REG. NO. 16,310	
Signature		Date December 7, 1998

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**FEE TRANSMITTAL**

Patent fees are subject to annual revision on October 1.

These are the fees effective October 1, 1997.

Small Entity payments must be supported by a small entity statement, otherwise large entity fees must be paid. See Forms PTO/SB/09-12.

See 37 C.F.R. §§ 1.27 and 1.28.

TOTAL AMOUNT OF PAYMENT (\$)**55.00****Complete if Known**

Application Number	08/797,188
Filing Date	February 11, 1998
First Named Inventor	PETER C. DeANGELIS
Examiner Name	J. Moore
Group / Art Unit	3301
Attorney Docket No.	ROKEN-40907

**METHOD OF PAYMENT (check one)**

- 1.
- ☒
- The Commissioner is hereby authorized to charge indicated fees and credit any over payments to:

Deposit  
Account  
Number  
Deposit  
Account  
Name

06-2425

FULWIDER PATTON et al.

☐ Charge Any Additional☒ Fee Required Under  
37 C.F.R. §§ 1.16 and 1.17☐ Charge the Issue Fee Set in  
37 C.F.R. § 1.18 at the Mailing  
of the Notice of Allowance

- 2.
- ☒
- Payment Enclosed:

☒ Check ☐ Money  
Order ☐ Other**FEE CALCULATION****1. BASIC FILING FEE**

Large Entity Fee Code (\$)	Small Entity Fee Code (\$)	Fee Description	Fee Paid
101 790	201 395	Utility filing fee	
106 330	206 165	Design filing fee	
107 540	207 270	Plant filing fee	
108 790	208 395	Reissue filing fee	
114 150	214 75	Provisional filing fee	

SUBTOTAL (1) (\$)

**2. EXTRA CLAIM FEES**

Total Claims	Extra Claims	Fee from below	Fee Paid
Independent Claims	-20** =	X	
Multiple Dependent	-3** =	X	

\*\*or number previously paid, if greater; For Reissues, see below

Large Entity Fee Code (\$)	Small Entity Fee Code (\$)	Fee Description	Fee Paid
103 22	203 11	Claims in excess of 20	
102 82	202 41	Independent claims in excess of 3	
104 270	204 135	Multiple dependent claim, if not paid	
109 82	209 41	** Reissue independent claims over original patent	
110 22	210 11	** Reissue claims in excess of 20 and over original patent	

SUBTOTAL (2) (\$)

**FEE CALCULATION (continued)****3. ADDITIONAL FEES**

Large Entity Fee Code (\$)	Small Entity Fee Code (\$)	Fee Description	Fee Paid
105 130	205 65	Surcharge - late filing fee or oath	
127 50	227 25	Surcharge - late provisional filing fee or cover sheet.	
139 130	139 130	Non-English specification	
147 2,520	147 2,520	For filing a request for reexamination	
112 920*	112 920*	Requesting publication of SIR prior to Examiner action	
113 1,840*	113 1,840*	Requesting publication of SIR after Examiner action	
115 110	215 55	Extension for reply within first month	
116 400	216 200	Extension for reply within second month	
117 950	217 475	Extension for reply within third month	
118 1,510	218 755	Extension for reply within fourth month	
128 2,060	228 1,030	Extension for reply within fifth month	
119 310	219 155	Notice of Appeal	
120 310	220 155	Filing a brief in support of an appeal	
121 270	221 135	Request for oral hearing	
138 1,510	138 1,510	Petition to institute a public use proceeding	
140 110	240 55	Petition to revive - unavoidable	
141 1,320	241 660	Petition to revive - unintentional	
142 1,320	242 660	Utility issue fee (or reissue)	
143 450	243 225	Design issue fee	
144 670	244 335	Plant issue fee	
122 130	122 130	Petitions to the Commissioner	
123 50	123 50	Petitions related to provisional applications	
126 240	126 240	Submission of Information Disclosure Stmt	
581 40	581 40	Recording each patent assignment per property (times number of properties)	
146 790	246 395	Filing a submission after final rejection (37 CFR 1.129(a))	
149 790	249 395	For each additional invention to be examined (37 CFR 1.129(b))	

Other fee (specify) **Terminal Disclaimer**

Other fee (specify)

\* Reduced by Basic Filing Fee Paid

SUBTOTAL (3) (\$)**55.00****SUBMITTED BY**Typed or  
Printed Name **Ellsworth R. Roston, Esq.**

Signature

*Ellsworth R. Roston*

Date


12/7/98

**Complete (if applicable)**Reg. Number **16,310**Deposit Account  
User ID**06-2425**

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CERTIFICATE OF MAILING UNDER 37 C.F.R. § 1.8

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Commissioner for Patents, Washington, D.C.  
20231 on December 7, 1998.

  
Ellsworth R. Roston, Reg. No. 16,310

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of	)	Date: December 7, 1998
	)	
PETER C. DEANGELIS	)	Group Art Unit: 3301
	)	
Serial No.: 08/797,188	)	Examiner: J. Moore
	)	
Filed: February 11, 1997	)	Docket No.: ROKEN-40907
	)	(D-3037) [#121489/v.2]
For: SYSTEM AND METHOD FOR	)	
CONTROLLING THE	)	
OPERATION OF TOYS	)	Los Angeles, California 90024

**TERMINAL DISCLAIMER**

ROKENBOK TOY COMPANY, represents that it is a corporation of the  
State of California, that its place of business is at 119 Aberdeen, Suite 7, Cardiff, CA  
92007, and that it is the assignee of record from the inventor Peter C. DeAngelis of the  
entire right, title and interest in and to application Serial No. 08/797,188 filed February  
11, 1997, which assignment was recorded on February 11, 1997, at Reel 8459, Frames  
0898-0901, for a "SYSTEM AND METHOD FOR CONTROLLING THE OPERATION

OF TOYS". Your petitioner hereby disclaims, from the date of the expiration of any patent to be issued from application 08/578,210, actually filed on December 29, 1995, the patent to be issued from the above application. Your petitioner hereby agrees that any patent so granted on this application Serial No. 08/797,188 shall be enforceable only for and during such period that the legal title to the patent to be issued on this application Serial No. 08/797,188 shall be the same as the legal title to any patent to be issued from application 08/578,210, this agreement to run with any patent granted on this application Serial No. 08/797,188 and to be binding upon the grantor (your petitioner), its successors and assigns.

In making the above disclaimer, petitioner does not disclaim the terminal part of any patent granted on the instant application that would extend to the expiration date of the full statutory term as defined in 35 U.S.C. 154 to 156 and 173, as presently shortened by any terminal disclaimer, of the patent to be issued from application 08/578,210 in the event that such patent later: expires for failure to pay a maintenance fee, is held unenforceable, is found invalid by a court of competent jurisdiction, is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321, has all claims canceled by a reexamination certificate, is reissued, or is otherwise terminated prior to the expiration of its full statutory term as presently shortened by any terminal disclaimer.

For submissions on behalf of ROKENBOK TOY COMPANY, the undersigned (whose title is supplied below) is empowered to act on behalf of the organization.

The evidentiary documents accompanying or referred to in the Terminal Disclaimer have been reviewed by the undersigned and it is hereby certified that, to the best of the assignee's knowledge and belief, title is in the assignee seeking to take action.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true and further that these statements have been made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of this application 08/696,263 or any patent issued from this application 08/696,263.

Serial No. 08/797,188

*PATENT*

The statutory disclaimer fee is enclosed.

ROKENBOK TOY COMPANY

Ellsworth R. Roston

Ellsworth R. Roston

Registration No. 16,310

Attorney of record for

Rokenbok Toy Company

ERR:cm

FULWIDER PATTON LEE & UTECHT, LLP

10877 Wilshire Boulevard, Tenth Floor

Los Angeles, CA 90024

Telephone: (310) 824-5555

**FULWIDER PATTON LEE & UTECHT, LLP**

DATE INVOICE NO. OR REFERENCE

12.3.98 ROKEN 40907

AMOUNT

55.00

DISCOUNT

1231

BA

**TOTALS**

55.00

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**FULWIDER PATTON LEE & UTECHT, LLP**

ATTORNEYS AT LAW

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OTHER ORDER OF

Assistant Commissioner for Patents

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*Debra H. Lee*  
AUTHORIZED SIGNATURE

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**FULWIDER PATTON LEE & UTECHT, LLP**

DATE	INVOICE NO. OR REFERENCE	AMOUNT	DISCOUNT	BALANCE
12.3.98	ROKEN 40907	55.00	1231	

**TOTALS**

55.00

Applicant: ROKENBOK TOY COMPANY

Docket No.: ROKEN-40907

Serial No.: 08/797,188

Atty/Secy: ERR/cm

Filed: February 11, 1998

Title: SYSTEM AND METHOD FOR CONTROLLING THE OPERATION OF  
TOYS

Inventor(s): PETER C. DeANGELIS

Please acknowledge receipt of the following documents due on December 8, 1998  
sent by First Class Mail on December 7, 1998 by stamping w/PTO stamp and  
returning postcard to addressee.

- ☒ X Transmittal Letter (Duplicate/Triplicate)
- ☐ Deposit Account No. \_\_\_\_\_ Order (Dupl./Tripl.)
- ☐ Extension of Time
- ☐ Amendment
- ☐ Amendment After Final
- ☐ Affidavit/Declaration
- ☐ Issue Fee (PTOL 85b)
- ☒ X Terminal Disclaimer

☒ X Check No. 059156 for \$ 55.00 for fees relating to the above-  
referenced documents.

17114/1998  
**received**

Applicant: ROKENBOK TOY COMPANY

Docket No.: ROKEN-40907 Atty/Secy: ERR/cm

Serial No.: 08/797,188 Filed: February 11, 1998

Title: SYSTEM AND METHOD FOR CONTROLLING THE OPERATION OF TOYS

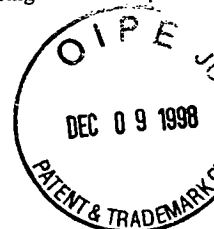
Inventor(s): PETER C. DeANGELIS

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☒ Terminal Disclaimer

☒ Check No. 059157 for \$ 55.00 for fees relating to the above-referenced documents.





Please type a plus sign (+) inside this box → ☐

PTO/SB/21 (12-97)  
Approved for use through 9/30/00. OMB 0651-0031  
Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE  
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<h1>TRANSMITTAL FORM</h1> <p>(to be used for all correspondence after initial filing)</p>	Application Number	08/797,188
	Filing Date	February 11, 1998
	First Named Inventor	PETER C. DeANGELIS
	Group Art Unit	3301
	Examiner Name	J. Moore
Total Number of Pages in This Submission	Attorney Docket Number	ROKEN-40907

ENCLOSURES (check all that apply)		
<input checked="" type="checkbox"/> Fee Transmittal Form	<input type="checkbox"/> Assignment Papers (for an Application)	<input type="checkbox"/> After Allowance Communication to Group
<input checked="" type="checkbox"/> Fee Attached	<input type="checkbox"/> Drawing(s)	<input type="checkbox"/> Appeal Communication to Board of Appeals and Interferences
<input type="checkbox"/> Amendment / Response	<input type="checkbox"/> Licensing-related Papers	<input type="checkbox"/> Appeal Communication to Group (Appeal Notice, Brief, Reply Brief)
<input type="checkbox"/> After Final	<input type="checkbox"/> Petition Routing Slip (PTO/SB/69) and Accompanying Petition	<input type="checkbox"/> Proprietary Information
<input type="checkbox"/> Affidavits/declaration(s)	<input type="checkbox"/> To Convert a Provisional Application	<input type="checkbox"/> Status Letter
<input type="checkbox"/> Extension of Time Request	<input type="checkbox"/> Power of Attorney, Revocation Change of Correspondence Address	<input checked="" type="checkbox"/> Additional Enclosure(s) (please identify below)
<input type="checkbox"/> Express Abandonment Request	<input checked="" type="checkbox"/> Terminal Disclaimer	Postcard
<input type="checkbox"/> Information Disclosure Statement	<input type="checkbox"/> Small Entity Statement	
<input type="checkbox"/> Certified Copy of Priority Document(s)	<input type="checkbox"/> Request for Refund	
<input type="checkbox"/> Response to Missing Parts/Incomplete Application	Remarks	
<input type="checkbox"/> Response to Missing Parts under 37 CFR 1.52 or 1.53		

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT	
Firm or Individual name	FULWIDER PATTON LEE & UTECHT, LLP ELLSWORTH R. ROSTON, ESQ., REG. NO. 16,310 <i>Ellsworth R. Roston</i>
Signature	
Date	December 7, 1998

CERTIFICATE OF MAILING	
I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231 on this date: 12/7/98	
Typed or printed name	ELLSWORTH R. ROSTON, ESQ., REG. NO. 16,310
Signature	<i>Ellsworth R. Roston</i>
Date	December 7, 1998

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<h1 style="margin: 0;">FEE TRANSMITTAL</h1> <p style="font-size: small; margin: 5px 0;">Patent fees are subject to annual revision on October 1. These are the fees effective October 1, 1997. Small Entity payments <u>must</u> be supported by a small entity statement, otherwise large entity fees must be paid. See Forms PTO/SB/09-12. See 37 C.F.R. §§ 1.27 and 1.28.</p>		Complete if Known	
		Application Number	08/797,188
		Filing Date	February 11, 1998
		First Named Inventor	PETER C. DeANGELIS
		Examiner Name	J. Moore
		Group / Art Unit	3301
TOTAL AMOUNT OF PAYMENT (\$)		55.00	
		Attorney Docket No.	ROKEN-40907

<h3 style="text-align: center; margin: 0;">METHOD OF PAYMENT (check one)</h3> <p>1. <input checked="" type="checkbox"/> The Commissioner is hereby authorized to charge indicated fees and credit any over payments to:</p> <p>Deposit Account Number <u>06-2425</u></p> <p>Deposit Account Name <u>FULWIDER PATTON et al.</u></p> <p><input checked="" type="checkbox"/> Charge Any Additional Fee Required Under 37 C.F.R. §§ 1.16 and 1.17      <input type="checkbox"/> Charge the Issue Fee Set in 37 C.F.R. § 1.18 at the Mailing of the Notice of Allowance</p> <p>2. <input checked="" type="checkbox"/> Payment Enclosed:  <input checked="" type="checkbox"/> Check    <input type="checkbox"/> Money Order    <input type="checkbox"/> Other</p>	<h3 style="text-align: center; margin: 0;">FEE CALCULATION (continued)</h3> <h4>3. ADDITIONAL FEES</h4> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Large Entity Fee Code (\$)</th> <th>Small Entity Fee Code (\$)</th> <th>Fee Description</th> <th>Fee Paid</th> </tr> </thead> <tbody> <tr><td>105</td><td>130</td><td>205</td><td>65</td><td>Surcharge - late filing fee or oath</td><td></td></tr> <tr><td>127</td><td>50</td><td>227</td><td>25</td><td>Surcharge - late provisional filing fee or cover sheet</td><td></td></tr> <tr><td>139</td><td>130</td><td>139</td><td>130</td><td>Non-English specification</td><td></td></tr> <tr><td>147</td><td>2,520</td><td>147</td><td>2,520</td><td>For filing a request for reexamination</td><td></td></tr> <tr><td>112</td><td>920*</td><td>112</td><td>920*</td><td>Requesting publication of SIR prior to Examiner action</td><td></td></tr> <tr><td>113</td><td>1,840*</td><td>113</td><td>1,840*</td><td>Requesting publication of SIR after Examiner action</td><td></td></tr> <tr><td>115</td><td>110</td><td>215</td><td>55</td><td>Extension for reply within first month</td><td></td></tr> <tr><td>116</td><td>400</td><td>216</td><td>200</td><td>Extension for reply within second month</td><td></td></tr> <tr><td>117</td><td>950</td><td>217</td><td>475</td><td>Extension for reply within third month</td><td></td></tr> <tr><td>118</td><td>1,510</td><td>218</td><td>755</td><td>Extension for reply within fourth month</td><td></td></tr> <tr><td>128</td><td>2,060</td><td>228</td><td>1,030</td><td>Extension for reply within fifth month</td><td></td></tr> <tr><td>119</td><td>310</td><td>219</td><td>155</td><td>Notice of Appeal</td><td></td></tr> <tr><td>120</td><td>310</td><td>220</td><td>155</td><td>Filing a brief in support of an appeal</td><td></td></tr> <tr><td>121</td><td>270</td><td>221</td><td>135</td><td>Request for oral hearing</td><td></td></tr> <tr><td>138</td><td>1,510</td><td>138</td><td>1,510</td><td>Petition to institute a public use proceeding</td><td></td></tr> <tr><td>140</td><td>110</td><td>240</td><td>55</td><td>Petition to revive - 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SUBMITTED BY				Complete (if applicable)	
Typed or Printed Name	Ellsworth R. Roston, Esq.			Reg. Number	16,310
Signature	<u>Ellsworth R. Roston</u>	Date	12/7/98	Deposit Account User ID	06-2425

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of	)	Date: December 7, 1998
	)	
PETER C. DEANGELIS	)	Group Art Unit: 3301
	)	
Serial No.: 08/797,188	)	Examiner: J. Moore
	)	
Filed: February 11, 1997	)	Docket No.: ROKEN-40907
	)	(D-3037) [#121489v.1]
For: SYSTEM AND METHOD FOR	)	
CONTROLLING THE	)	
OPERATION OF TOYS	)	Los Angeles, California 90024

**TERMINAL DISCLAIMER**

ROKENBOK TOY COMPANY, represents that it is a corporation of the  
State of California, that its place of business is at 119 Aberdeen, Suite 7, Cardiff, CA  
92007, and that it is the assignee of record from the inventor Peter C. DeAngelis of the  
entire right, title and interest in and to application Serial No. 08/797,188 filed February  
11, 1997, which assignment was recorded on February 11, 1997, at Reel 8459, Frames  
0898-0901, for a "SYSTEM AND METHOD FOR CONTROLLING THE OPERATION

OF TOYS". Your petitioner hereby disclaims, from the date of the expiration of any patent to be issued from application 08/696,263 filed on August 13, 1996, the patent to be issued from the above application. Your petitioner hereby agrees that any patent so granted on this application Serial No. 08/797,188 shall be enforceable only for and during such period that the legal title to the patent to be issued on this application Serial No. 08/797,188 shall be the same as the legal title to any patent to be issued from application 08/696,263, this agreement to run with any patent granted on this application Serial No. 08/797,188 and to be binding upon the grantor (your petitioner), its successors and assigns.

In making the above disclaimer, petitioner does not disclaim the terminal part of any patent granted on the instant application that would extend to the expiration date of the full statutory term as defined in 35 U.S.C. 154 to 156 and 173, as presently shortened by any terminal disclaimer, of the patent to be issued from application 08/696,263 in the event that such patent later: expires for failure to pay a maintenance fee, is held unenforceable, is found invalid by a court of competent jurisdiction, is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321, has all claims canceled by a reexamination certificate, is reissued, or is otherwise terminated prior to the expiration of its full statutory term as presently shortened by any terminal disclaimer.

For submissions on behalf of ROKENBOK TOY COMPANY, the undersigned (whose title is supplied below) is empowered to act on behalf of the organization.

The evidentiary documents accompanying or referred to in the Terminal Disclaimer have been reviewed by the undersigned and it is hereby certified that, to the best of the assignee's knowledge and belief, title is in the assignee seeking to take action.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true and further that these statements have been made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of this application 08/696,263 or any patent issued from this application 08/696,263.

Serial No. 08/578,210

*PATENT*

The statutory disclaimer fee is enclosed.

ROKENBOK TOY COMPANY

Ellsworth R. Roston

Ellsworth R. Roston

Registration No. 16,310

Attorney of record for

Rokenbok Toy Company

ERR:cm

FULWIDER PATTON LEE & UTECHT, LLP

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Applicant: ROKENBOK TOY COMPANY

Docket No.: ROKEN-40907

Atty/Secy: ERR/cm

Serial No.: 08/797,188

Filed: February 11, 1998

Title: SYSTEM AND METHOD FOR CONTROLLING THE OPERATION OF TOYS

Inventor(s): PETER C. DeANGELIS

Please acknowledge receipt of the following documents due on December 8, 1998 sent by First Class Mail on December 7, 1998 by stamping w/PTO stamp and returning postcard to addressee.

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